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HOW TO
ATTRACT
AND
PROTECT
WILD BIRDS.

A FULL DESCRIPTION OF
SUCCESSFUL METHODS.

Third Revised Edition.

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Screw-nails, 3d. per dozen.

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NOTE.—Specimens of the above may be seen at the Offices of the ROYAL SOCIETY FOR THE PROTECTION OF BIRDS from whom also further particulars may be obtained.

A List of European Birds mentioned in this Book, with a List of North American Birds corresponding to them in place and manner of Nesting.

By CLINTON G. ABBOTT

Member Linnaean Society, Associate American Ornithologists' Union

Linnet, Greenfinch, Chaffinch, Hedge Sparrow, Yellowhammer.....	{	Field Sparrow, Chipping Sparrow, Song Sparrow, Indigo Bunting.
Garden Warbler, Icterine Warbler, Whitethroat, Lesser Whitethroat....	{	Yellow Warbler, Chestnut-sided Warbler, Redstart, Chat, Rose-breasted Grosbeak.
Fieldfare, Song Thrush, Blackbird.....		Robin, Wood Thrush, Catbird, Thrasher
Golden Oriole		Baltimore Oriole, Orchard Oriole.
Goldfinch		American Goldfinch.
Hawfinch		Purple Finch, Scarlet Tanager.
Chiffchaff, Wood Warbler.....	{	Black-and-White Warbler, Ovenbird, Worm-eating Warbler.
Spotted Flycatcher, Pied Flycatcher....	{	Great-crested Flycatcher, Wood Pewee, Least Flycatcher.
Nuthatch.....	{	Red-breasted Nuthatch, White-breasted Nuthatch.
Golden-crested Wren.....		Golden-crowned Kinglet.
Redstart, Black Redstart, Pied Wagtail, White Wagtail, Wren, Robin....	{	Phoebe, Carolina Wren, House Wren.
Kingfisher		Belted Kingfisher.
Wild Duck		Mallard, Black Duck, etc.
Tree Creeper.....		Brown Creeper.
Moorhen, Little Grebe.....	{	Florida Gallinule, American Coot, Virginia Rail, Sora Rail, Grebe.
Great Tit, Blue Tit, Marsh Tit, Coal Tit, Crested Tit	{	Chickadee, Tufted Titmouse.
Long-tailed Tit.....		Bush Tit.
Starling		Starling, Purple Martin.
Wryneck, Hoopoe.....		Bluebird.
Jackdaw, Barn Owl, Little Owl, Kestrel, Stock Dove.....	{	Barn Owl, Barred Owl, Screech Owl, Acadian Owl.
Nightingale, Bluethroat.....		Veery, Louisiana Water Thrush.
Sedge Warbler.....	{	Long-billed Marsh Wren, Short-billed Marsh Wren, Red-winged Blackbird.
House Martin.....		Eaves Swallow, Barn Swallow.
Swift		Chimney Swift.
Green Woodpecker, Roller.....		Flicker, Sparrow Hawk.
Black Woodpecker.....		Pileated Woodpecker.
Grey Woodpecker, Greater, Middle and Lesser Spotted Woodpeckers, Three-toed Woodpecker, Syrian Wood'ker	{	Hairy Woodpecker, Downy Woodpecker, Red-headed Woodpecker.

Red-backed Shrike, Woodchat Shrike..	Loggerhead Shrike, Northern Shrike.
Merganser.....	American Merganser.
Jay, Magpie.....	Blue Jay, Black-billed Magpie.
House Sparrow, Tree Sparrow.....	English Sparrow.
Corn Bunting.....	Vesper Sparrow, Grasshopper Sparrow.
Reed Bunting.....	Swamp Sparrow.
Wheatear... .	Nighthawk, Upland Plover.
Whinchat, Stonechat.....	Maryland Yellowthroat, Towhee.
Tree Pipit, Blue-headed Wagtail.....	Bobolink, Meadowlark.
Sparrow-Hawk, Goshawk.....	} Sharp-shinned Hawk, Cooper's Hawk American Goshawk.
Buzzard.....	
	Red-shouldered Hawk, Red-tailed Hawk.

¶ Adaptability of the various Boxes described in Chapter I to American Birds:

Box A ¶ Chickadee, Tufted Titmouse, House Wren, Tree Swallow, Red-breasted Nuthatch Brown Creeper, Prothonotary Warbler.
(1¼-inch opening)

Box A1 ¶ Chickadee, House Wren.
(1⅛-inch opening)

Box B ¶ All Birds mentioned for Box A. Also Downy Woodpecker, Bluebird, Purple Martin, White-breasted Nuthatch, Starling, Carolina Wren, Great-crested Flycatcher.
(1½-inch opening)

Box C ¶ Hairy Woodpecker, Bluebird, Purple Martin, Starling, Great-crested Flycatcher, Flicker, Red-headed Woodpecker, Yellow-bellied Sapsucker, Red-bellied Woodpecker, Sparrow Hawk, Acadian Owl.
(2⅝-inch opening)

Box D ¶ Flicker, Sparrow Hawk, Acadian Owl, Screech Owl, Pileated Woodpecker, Wood Duck, Goldeneye, Barn Owl, American Merganser.
(3¼-inch opening)

Box E ¶ All Birds mentioned for Boxes A and B except Downy Woodpecker.
(3⅞ x 1⅞-inch opening)

Box F ¶ Carolina Wren, Phœbe.
(Size, 2¼ x 4¼ inches)

¶ None of the Boxes appears to be large enough to accommodate the Barred Owl.

HOW TO
**ATTRACT AND PROTECT
WILD BIRDS**

BY
MARTIN HIESEMANNN

TRANSLATED BY
EMMA S. BUCHHEIM

WITH AN INTRODUCTION BY
HER GRACE THE DUCHESS OF BEDFORD

THIRD EDITION WITH MANY REVISIONS

WITH MANY ILLUSTRATIONS

LONDON
WITHERBY & CO. 326 HIGH HOLBORN
1912

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FIRST ENGLISH EDITION, SEPTEMBER, 1908.

SECOND ENGLISH EDITION, JANUARY, 1911.

THIRD ENGLISH EDITION, MARCH, 1912.

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INTRODUCTORY NOTE.

THE following pages form an admirable treatise, not only on bird protection, but more than that, on bird preservation. Game birds have long been carefully preserved by means of a close season, by the destruction of their enemies, the provision of plantations and coverts for nesting and shelter, and by feeding.

The Baron von Berlepsch has applied the system of game preservation to all useful birds, and his methods, as recorded in this book, are convincing by reason of their very thoroughness, and have proved most successful.

The essential part of the plan is the provision of suitable nesting places, special attention having been given to birds which nest in holes.

Detailed description is given of the method of growing and pruning bushes in such a manner as to provide suitable nesting sites for warblers, etc.

Directions are also given as to feeding in winter, and it will be noticed that the birds which benefit most by Baron von Berlepsch's system are those which are most useful to Agriculture and Forestry.

M. BEDFORD.

PREFACE TO THE THIRD GERMAN EDITION.

IN the last year and a half unexpected progress has been made in the efforts to protect birds, and it is a matter of course that the experimental and model station for the protection of birds belonging to Baron von Berlepsch at Seebach has directly and indirectly taken a prominent part in the work. Owing to the valuable support of the Minister of Agriculture, Crown Lands and Forests we now possess in this station a central station authorised by the State, a unique circumstance of great importance.

The present work naturally could not pass over this fortunate change, as the author has based his descriptions so closely on the Seebach experimental station. This third edition has, therefore, been altered and enlarged in many essential points.

I have, as usual, continued to make enquiries on current changes and have discussed all that is new in this edition with Baron von Berlepsch and the other gentlemen who are active in bird protection. I must seize this opportunity of thanking them sincerely.

The book was specially recommended by the Minister of Agriculture, Crown Lands and Forests on June 26th, 1907, and 21,000 separate impressions were distributed to the different officials whom it concerned.

May this third edition also be kindly received everywhere.

MARTIN HIESEMANN.

Heiligenstadt,

February, 1909.

PREFACE TO THE SECOND GERMAN EDITION.

AFTER a comparatively short time—barely four months since its first appearance—a new edition of this book has become necessary: surely the best proof that it was issued opportunely, and that it satisfied a long-felt want. This is proved by the fact that it will shortly appear in an English, a French, and a Polish translation.

I should like to thank, in the name of the good cause, the Commission for whom I undertook the task, and to whose unwearied energy and efforts the quick spread of the work has been due. I feel that I owe a special debt of gratitude to Baron von Berlepsch, who, most generously gave me full information on all questions which I referred to him. I think I may say I talked over every point with him before writing.

May the second edition, which has undergone many alterations and additions—the most recent ornithological observations are given—find a kindly welcome everywhere, and help to preserve our birds, so that they may prove a blessing to agriculture and forestry, and a joy to every friend of Nature. This will always be the best reward for my work.

MARTIN HIESEMANN.

Heiligenstadt,

June, 1907.

PREFACE TO THE FIRST GERMAN EDITION.

THE "Kommission zur Beförderung des Vogelschutzes,"* appointed at the instigation of the President of the "Verband der Tierschutzvereine des deutschen Reiches," conferred on me the honourable task of writing a book which should give a clear account of the principles and of the measures which Baron von Berlepsch advocates for the exercise of a rational protection of birds, and which have not only been tested, but have also been recommended by the State.

Although I felt honoured and gratified on receiving this commission, I thought it right to ascertain what were Baron von Berlepsch's views on the subject, especially as it would be necessary for me to obtain information from him personally, and to make a thorough study of the experimental station at Seebach. His answer to my letter of enquiry was as follows:—

"I can only say that I am delighted to find that others carry out my ideas and employ their own experiences and studies in the good cause in order to complete my teaching. Those who, like you, are influenced by interest in the cause, can always count on my assistance."

I therefore undertook the task with pleasure, and thought I could not carry it out better than by closely describing the experimental station at Seebach. Again and again I went to see it at all times of the year, and now, on completing my book, I have again spent four weeks there.

The illustrations are all made, from original drawings and photographs, by the artist E. Hermle.

Baron von Berlepsch, to whom I showed my book when it was finished, declared that my work carried out his ideas in every respect, and that I had introduced correctly the most recent results which had not previously been published.

The purpose of this book is to provide the general public with a guide which shall be easy to understand, and above all things cheap, and thus supply a long-felt want in the literature on this subject.

May this book make its way in the world. May the hopes be fulfilled with which it is sent forth.

MARTIN HIESEMANN.

Heiligenstadt,
January, 1907.

* The "Commission" at the present time consists of Dr. Falke, Professor of Agriculture at the University of Leipsic (president); Herr Max Rabe, Leipsic (secretary); Pastor Otto Kleinschmidt, Volkmaritz, near Dederstedt, District Halle-a.-S.; Major z. D. Henrici, Cassel. Baron von Berlepsch was, of course, chosen on the "Commission." He declined the honour, as he has done in all similar cases, but he assists the "Commission" as a friend and adviser.

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SECTION I.

GENERAL REMARKS ON BIRD-PROTECTION.

I.—THE PRESENT POSITION OF AFFAIRS REGARDING THE PROTECTION OF BIRDS.

Most people have been struck by the increased attention that has recently been paid to the protection of birds, and they must have hailed this movement with delight. In newspapers, journals, books, and pamphlets we come across articles and essays dealing with the various attempts to promote this object; while societies and communities, as well as individuals, exert themselves on all sides in the good cause.

The energetic fashion in which Government authorities have taken up the question of the protection of birds on a rational basis deserves special mention. We need only refer here to the Paris Convention of June, 1895, which was signed by most of the European States, to the "Guide for carrying out the Protection of our Native Birds," issued by the Prussian Board of Agriculture, Crown Lands, and Forests, the Orders issued for enforcing protection, the State authorization and support of the Seebach experimental station, and to the far-reaching and practical measures which have been introduced into the Kingdom of Bavaria, the Grand Duchies of Hesse and Baden, the State of Hamburg, and other German States.

The Act for the Protection of Birds has at last become law in the German Empire, and deserves to be specially mentioned. I should like to thank, in the name of the cause, those who worked so cheerfully

for its accomplishment in spite of opposition. It is this Act that gives real protection to our feathered friends, and selfish motives can no longer interfere with a practical protection of birds. Things permissible, and perhaps useful at a time when birds were more numerous and the conditions of life more favourable, become impossible in our present state of civilization, which has resulted in a rapid decrease in the number of birds.

The measures for the preservation of sea-birds deserve special attention. The Island of Memmert, between Borkum and Norderney, was, at the instigation of certain sensible people, set aside by the Prussian State as a reservation for these birds, with an annual grant towards the appointment of a keeper. So far the results have been remarkably successful.

The Jordsand Society for Establishing Breeding Places for Birds on the German Coast, a branch of the German Society for the Protection of Birds, is working hard under the direction of its chairman, Dr. Franz Dietrich, 15, Freiligrathstrasse, Hamburg, 24, to prevent the threatened destruction of our sea-birds and to preserve this characteristic beauty of our sea-coasts. We hope that his efforts may be assisted by a large increase in the number of members.

The Finance Department of the Grand Duchy of Saxony has issued an excellent order for the protection of birds to the Woods and Forest Department. It is as follows :—

“When the trees are being topped, the undergrowth is to be preserved as far as possible as, apart from its value for the woods and for game, it provides the birds with sheltered breeding-places, of which they readily avail themselves. Where birds are known to breed freely, especially near water, certain suitable thickets are to be left untouched. As far as possible, topping is not to be carried on during the chief breeding season in young plantations, *i.e.*, from the middle of May to the middle of July. As many species prefer stacks of wood and brushwood as breeding-places and many broods are destroyed when they are carted away, care should be taken to remove the wood before the breeding season begins, as it is generally impossible to wait till its close. Hedges are not to be pruned till the close of the breeding season. Natural hedges, bushes and thorns should be left as far as possible on the sides of the roads, and on embankments.

Berry-bearing trees and bushes whose berries tend to preserve and keep healthy the singing birds must be preserved and cultivated as much as possible. Damp or marshy spots and pools are not to be drained if possible, especially as the preservation of water is important for woods from the cultural point of view. The breeding bird requires water in the immediate vicinity of its nest, and the want of it has robbed entire tracts of woods of useful birds. Decaying trees of small value which the useful birds that nest in holes prefer as breeding-places should be preserved, if their destruction is not absolutely necessary. In coniferous and deciduous thickets, brushwood should be piled on wooden stands in sheltered places to serve as breeding-places for singing birds that build in the open. These stands must be made of poles and rest on feet some $6\frac{1}{2}$ feet high. They must be provided with barbed wire or thorns as a protection against weasels, martens, cats, etc., and the neighbourhood of trees with low branches should be avoided, so that the vermin cannot jump from the branches on to the stand. In addition nesting-places can easily be made for birds breeding in the open, if densely-foliaged or coniferous branches are bent together and tied, the lower part coming uppermost. This not only makes a firm foundation for the nest, but provides a suitable shelter. As a bird, when sitting, has a great desire for water, this can be provided by small dams at the springheads and in some places by deepening damp spots. Special attention must be paid to reducing the vermin which are dangerous to the birds and their young, especially cats, which are so very harmful. Squirrels, magpies, jays, jackdaws and crows must not be allowed to increase unduly."

Since April 1st, 1906, Hamburg has had a bird-keeper appointed by the State, Otto Theil, who was trained for three years at Cassel and at Seebach by Baron von Berlepsch and his old bird-keeper, Jakob Mey. He has hung up boxes and laid out shelter-woods for local boards and private persons as well as for the State. and on State property at Riepenburg, near Zollenspieker, in Vierlanden, he has made a model station for bird-protection after the Seebach pattern. Over three acres of shelter-woods for birds have already been planted, winter-feeding and the destruction of the enemies of birds are being correctly carried out, and new plantations especially for water-birds are being planned. The possession by Hamburg of an establish-

ment that can compare with the Berlepsch experimental station is only a question of time. The keeper Theil is under the Director of the Botanical Institute, Professor Zacharias, and as we have stated, his service is not confined to the State only, for he is at the disposal of private persons. We hope this example will be generally followed, as it is the only way of guaranteeing that all measures for bird-protection will be properly carried out.

The same activity is to be found in England, France, Austria-Hungary, Italy,* Sweden, Russia, Finland, Holland, America, Japan, and other countries, all of which take the greatest interest in the protection of birds.

The Hungarian Ornithological Central Bureau has now also established a State station for bird-protection on the Margareten Island, near Budapest, under the direction of its well-known head, Herr Otto Herman. Hungary also possesses an excellent means of training the young in the interests of bird-protection in the "Bird and Arbor Day," after the American pattern. Our respect and gratitude are due to the leaders of these efforts, especially to the Minister of Agriculture, Herr Darányi and to Herr Otto Herman and Herr Titus Csörgey.

The Austrian Society for the Protection of Birds intends to plant jubilee groves to attract singing and useful birds. The Minister of Agriculture, Dr. Schreiner, is a zealous friend of bird-protection.

The American President Roosevelt, in order to promote bird-protection on a large scale in a practical manner, has issued an order for which all bird-lovers will feel grateful. In accordance with his instructions a large district of 30,000 hectares on the borders of California and Oregon has been set apart as a reservation for the protection and increase of native birds. The place in question is considered the largest breeding-place for water-birds.

In England, excellent work is being done, especially by the Royal

* It may cause some surprise that Italy is mentioned here, as, unfortunately, bird-catching still flourishes in that country. But a change for the better has already taken place there; the educated classes are quite aware of the injury it causes, and are trying to instruct the people by lectures and writings. Many nesting-boxes have been hung up on private property, especially near vineyards; and shelter-woods for birds, in accordance with the principles laid down by Baron von Berlepsch, have been planted. There are also four journals which advocate the cause of the protection of birds.

Society for the Protection of Birds, which trains and employs "watchers" to protect birds during the nesting season.

It is significant that the measures taken by the respective States for the protection of birds are based on the principles of Baron von Berlepsch, a fact which is sufficiently proved by the numerous translations of his work.*

The representatives of various German States have repeatedly stayed at Seebach for the purpose of studying thoroughly the measures employed at the experimental and model station. In 1910 the visitors were especially numerous, so that the visitors' book contains over six hundred names since April. To these we must add those who were sent by local boards and forest departments to attend the lectures there, and those who came of their own accord. It is to be hoped that this example will be followed elsewhere. Observations made on the spot are far more effective than books. There can be no doubt that those who have seen the arrangements at Seebach, and the marvellous results which they have produced, will be convinced, once for all, of the correctness of the methods employed.

The active interest which is taken on all sides in the protection of birds is undoubtedly a clear proof of its great importance; but it may not be out of place to bring forward a few reasons to justify it.

II.—REASONS FOR THE PROTECTION OF BIRDS.

THE protection of birds is first of all of importance from the point of view of the political economist. This has been sufficiently demonstrated by the thorough investigations which were carried out at an earlier period as well as recently. A few of the newest and most irrefutable proofs will be found on pp. 50 and 51; for the rest the reader is referred to the books dealing with this subject, especially those mentioned in the note.†

* "Der gesammte Vogelschutz, seine Begründung und Ausführung."

† The publications of the U.S. Board of Agriculture. The publications of the National Committee of Audobon Societies in North America. The publications of the Royal Society for the Protection of Birds in England. "Studien über die wirtschaftliche Bedeutung der insektenfressenden Vögel," "Magenuntersuchungen land-und forstwirtschaftlich wichtiger Vögel," "Tierwelt und Landwirtschaft," by Prof. Dr. Rörig. "Nutzen und Schaden der Vögel," by Otto Herman. Older works are those by Oken, Gloger, Lenz, Baldamus, Brehm, etc.

The principle of utilitarianism has taken such a strong hold on all classes of society nowadays, that many intelligent people have found that, much to their regret, they must begin, in many cases, by dwelling on the usefulness of birds. A one-sided view of the matter should be avoided, however, and I would point out the following fact:—We do not protect birds solely because they are useful, but chiefly from ethical and æsthetical reasons, as birds give beauty and animation to nature. We also wish to preserve their species, and hence the protection of birds signifies the preservation of the monuments of Nature.

It also promotes the protection of our home. The world of birds belongs to the home, of which it forms a by no means insignificant part. Without birds, Nature, in whose midst we dwell, would become desolate and cold. With the disappearance of birds the beauty and characteristic features of our home are in danger. It is therefore a pleasing sign of the times that this is one of the reasons why people pay more attention to the protection of birds, which was till recently so neglected, and in doing so, to the protection of home. Our native birds have always been most intimately associated with the thoughts of the people, from them they have drawn much of their poetical inspiration from ancient times to the present day. One thing is certain. Even those who, as Dr. Bräsz so finely says, timidly object to being called enthusiasts of nature, cannot refuse a certain amount of affection to the merry feathered crew in the silent bush.

Special attention should therefore be paid to what the above-mentioned official guide says in reference to this point:—"The native birds are not only very useful to agriculture, and woods and forests, but they add to the charm of nature." These are the motives which should serve as the motto of a really rational protection of birds, the motives which induced Baron von Berlepsch to take up his far-reaching and successful work in this field.

III.—HISTORY OF THE PROTECTION OF BIRDS.

THE efforts to protect birds date from the time when a marked decrease in their number was noted to the detriment of agriculture and forestry, and of the general harmony and beauty of Nature. We can accordingly trace back the history of the protection of birds to the 18th century.

Oken, Gloger, Lenz, Brehm, Russ and Liebe are the ornithologists with whom the history of the subject is connected.

With all due respect for those pioneers in the solution of the problem of bird-protection, we cannot conceal the fact that their efforts frequently ended in bitter disappointment. The matter was still in its infancy. There could be no question of any success worthy of the name, simply because the measures introduced were not in accordance with nature, but were for the most part fanciful inventions.

This was quite enough to prove fatal to a matter of such great importance. The want of success extinguished all interest. The protection of birds was regarded as an idle amusement at the close of the period in question. Then Baron von Berlepsch appeared, just in the nick of time. He recommended really useful measures, which guaranteed certain success from the first ; whereas the ornithologists already named had for years tried experiments which were more or less failures. From this time onwards we can prove that the protection of birds thrived and prospered.

Dr. Hartert is, therefore, right when he says in his excellent work* :—“The questions dealing with the protection of birds have now been directed into a regular channel, and take their course quietly, but with increased strength, under the *ægis* of Baron Hans von Berlepsch.” We are not saying too much if we designate Baron von Berlepsch as the mainspring of all efforts made in these days for the protection of birds. The whole matter, in its present shape and extent, is based on his ideas, and it can be built up only on this foundation.

Readers will be interested to learn how he was able to discover a solution of the problem of bird-protection. He owes his success to the fact that he carries on his experiments from a purely scientific point of view, without sentimentality or exaggeration.

He carried out Liebe's words :—“Learn to know the life of birds thoroughly if you wish to be sure of success in protecting them,” and devoted himself from his earliest youth to studying the world of birds, and to observing them carefully. Hence twenty years of quiet, incessant work lay behind him when he first made known his experiences. He still considers it the aim of his life to continue seeking the best ways of successfully protecting birds.

* “Einige Worte der Wahrheit über den Vögelschutz.”

His long journeys abroad were very useful in assisting him to solve the problem. He spent fifteen months in 1883-84 in Africa, Italy, and the islands of the Mediterranean; in 1886 he was nine months in South America, in the virgin forests of Paraguay and Western Brazil. He spent three months in 1888 in Italy, where he has since paid frequent short visits in order to study the migration of birds, and the methods of catching birds practised in that country.

The result of all his studies and observations was the conclusion that it is only by correcting Nature where man has marred her, by restoring the balance which has been disturbed, that the protection of birds can be properly dealt with, and that this can only be attained through Nature herself, or through an exact imitation of Nature. All so-called inventions for the protection of birds he considers absurd from the very outset, and the chief cause of former failures. And it is just because he always based his experiments upon Nature that they were crowned with entire success.

Baron von Berlepsch has, therefore, made it possible for us to carry out the protection of birds on a basis which is rational, and entirely in accordance with Nature.

“Baron von Berlepsch is the right man to make bird-protection popular, especially among gardeners and farmers, because, in consequence of close observation of Nature, he is free from that sentimentality which requires the most vital and important interests to be sacrificed to a hobby. A thorough and rational protection of birds is only possible where the representatives of agriculture and forestry join forces with those who are interested in birds from æsthetic and ethical motives, and work together for a common good. Unfortunately much energy was often wasted in angry quarrels.”
—*Baseler Nachrichten*, April, 1907.

One advantage of bird-protection, according to Baron von Berlepsch's methods, which must not be overlooked, is that it is thoroughly adapted to modern civilization.—It does not act as an obstacle, but is of direct service to the progress of agriculture and forestry. This explains why it has met with approval among those who objected to former attempts.

He is no mere theorist, for all that he has published on the subject of bird-protection has been thoroughly tested by him for many years

at his extensive experimental station at Seebach. As the following account is based on a study of the grounds at Seebach, it would, perhaps, be as well to give a description of them.

IV.—THE EXPERIMENTAL STATION AT SEEBACH.

(A) *General Remarks.*

THE ancestral castle of the Berlepsch family, dating from the 12th century, stands on the estate of Seebach, in the district of Langensalza, in Thuringia. On the same spot where one of his uncles did excellent work for agriculture, by means of his world-renowned experiments in bee-keeping, the present Baron won a similar success by means of his efforts for the protection of birds, which were of such importance from an agricultural point of view.

The area which has been used for the experiments comprises about 500 acres, of which 19 acres are park, 60 acres are thickets (poplar and willow plantations) for the birds, and 400 acres are wood.

The park which surrounds the old castle is of great interest to botanists, especially those interested in trees, because it contains examples of all the trees of Central Europe. Its special value, however, lies in the fact that the protection and encouragement of birds have received attention everywhere, but without undue prominence, in the laying out of the grounds. No one can fail to be struck by the luxuriant undergrowth which thrives even where the wood is densest. The owner has devoted special attention to the question of how the undergrowth, which is so important for bird-protection, is to be obtained under trees with dense foliage, and to finding out which trees are most suitable for the purpose. Bushes specially pruned for the purpose, and bushes or small branches specially tied together, serve as breeding-places for numerous birds that build in the open.

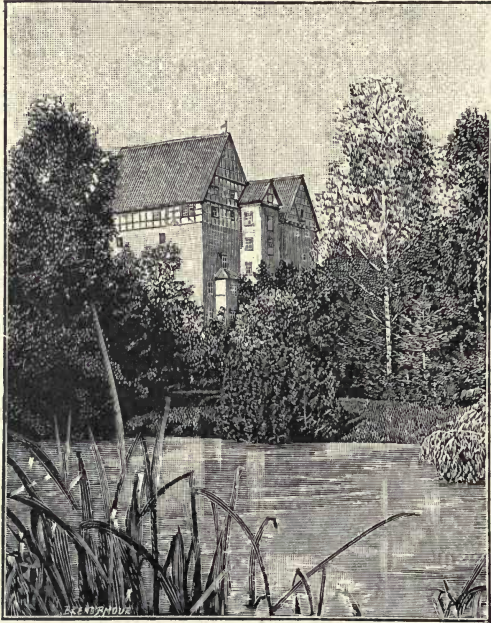
The two accompanying illustrations show how the protection of birds and of plants are carried out simultaneously on the estate, without losing sight of the æsthetic point of view.

The lake is inhabited by various species of water-birds, such as wild ducks, moorhens, little grebes, kingfishers, etc.

About 300 nesting-boxes hung up in the park are inhabited, without exception, by various birds that build in holes. Hidden in the bushes, unnoticed by those not in the secret, are traps for vermin, especially

for poaching cats, and in various spots are food-houses, and “food-bells” for winter feeding. The shelter-woods for the birds are in the neighbourhood of the brook which runs through the estate, or else near a ditch. Some of them are over thirty years old ; others have only been recently planted, so that their development can be plainly observed.

The copses in the fields show how existing plantations of mature growth may serve to attract birds—*i.e.*, may be altered without suffering damage into woods suitable for sheltering birds.

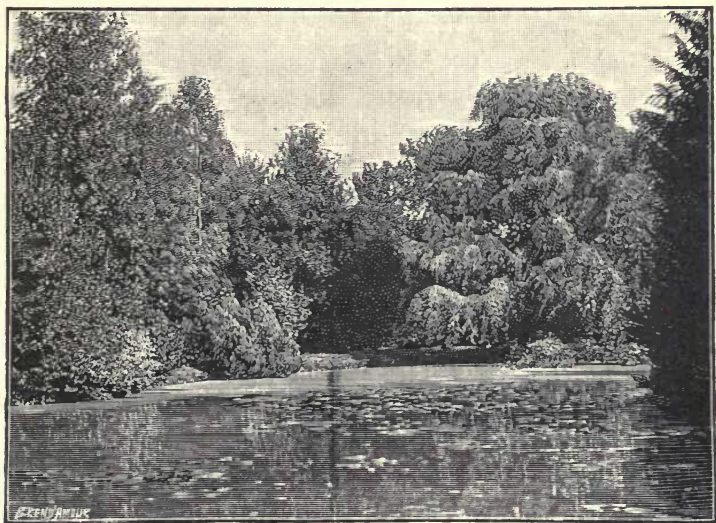


A VIEW OF THE CASTLE AND LAKE.

In the avenue the best way of treating tall trees and willows for the same purpose is demonstrated, and the wood, which is fully six miles distant from the plantations just described, contains over 2,000 nesting-boxes. As there is no open water within reach for a very great distance, drinking places for the birds have been planned, although the want of water has made no difference in the number of birds, “A striking proof that the birds, though undoubtedly they love water, can do without it where there are heavy showers.”

Whoever, like the author, has been able to observe the birds at Seebach at all seasons of the year must acknowledge that the experimental station there serves as a pattern and a model for all similar places. The success attained in every part of the experimental station is, to say the least, extraordinary.

The number of breeding birds cannot naturally be the same every year, nor can it constantly increase. It must rise or fall in accordance with the quantity of food, and particularly of insects, whose number again depends on the weather of each year. The increase in the birds,



THE LAKE.

which is noticeable when first properly-regulated bird-protection is introduced into a district that suffers from grubs, very naturally declines when the balance between the plant and insect life has been restored, and only when the conditions are again particularly favourable for insect life will the birds become more numerous.

The extraordinary number of birds that can inhabit a properly-prepared district is shown by a list compiled in Seebach in the year 1906. The years 1893 and 1900 had already been noted as remarkably good years for birds, but in 1906 the maximum number of breeding

birds were observed. In that year in the home park alone, which covers twelve or thirteen acres, there bred, in 1906, at least—

200 pairs of linnets.

100 „ greenfinches.

15 „ icterine warblers (*Hippolais hippolais*).

30 „ garden warblers, whitethroats, and lesser white-throats.

20 „ fieldfares (otherwise found as a breeding species in Germany in the northern and eastern parts only).

5 „ song thrushes.

5 „ blackbirds.

2 „ golden orioles.

10 „ goldfinches.

5 „ chaffinches.

Several pairs of hawfinches.

„ „ yellow-hammers.

„ „ hedge-sparrows.

„ „ wrens.

„ „ golden-crested wrens.

„ „ chiff-chaffs and wood-warblers.

„ „ red-backed shrikes (though many are shot).

„ „ nuthatches.

„ „ tree-creepers.

„ „ spotted fly-catchers and pied fly-catchers.

„ „ black redstarts and common redstarts.

„ „ sedge-warblers.

One pair of white wagtails.

„ „ kingfishers.

„ „ moorhens.

„ „ little grebes.

2 pairs of wild ducks.

30 „ tits (great tits, blue tits, and marsh-tits).

30 „ starlings (*see note, p. 45*).

Several pairs of wrynecks.

The holes in the walls of the old castle provide shelter for swifts, and other birds. Above, in the roof, dwell jackdaws, barn-owls, little owls (*Athene noctua*), and kestrels (*Falco tinnunculus*).

In a neighbouring barn is a colony of over 100 nests of house-martins.

In the "shelter-woods" and in the poplar and willow avenues we find the same kind of birds as in the park, but in far greater numbers, and in addition :—

Green woodpeckers.

Great and lesser spotted woodpeckers.

Woodchat shrikes (*Lanius senator*).

Blue-headed wagtails (*Motacilla flava*).

Wheatears.

Whinchats and stonechats.

Tree-pipits.

Corn-buntings and reed-buntings.

Blue-throats (*Erithacus cyaneculus*), and also nightingales (*Erithacus luscini*).

In the woods, on an average, 90 per cent. of the 2,000 nesting-boxes are inhabited by the five species of tits—great tit, blue tit, marsh-tit, coal-tit, crested tit—green woodpecker, grey woodpecker (*Picus viridicanus*), greater and middle spotted woodpecker (*Dendrocopus medius*), nuthatches, tree-creepers, pied fly-catchers, redstarts, and starlings. The boxes for the birds building in open cavities are inhabited by robins and wrens, and in the neighbourhood of the game-keeper's house by wagtails, black redstarts, and spotted fly-catchers.

Such results force us to acknowledge that the measures which have produced them are the only right ones, and we must agree with the remark that "these are conditions that undoubtedly remind us more of an aviary than of nature."

Baron von Berlepsch, as was stated above, looks on these extensive grounds as an experimental station in the first place, but he has also laid them out as a pattern station, which is at all times open to the inspection of those who come to see it, and it is in this light that he wishes it to be regarded.

(B) *Central Stations for Bird-Protection authorized by the State.*

The events of 1908 form an important landmark in the history of the development of experimental stations and the efforts for protecting birds. The experimental and model station for bird

protection at Seebach belonging to Baron von Berlepsch was raised by the State to a central station for the protection of birds.

It had long outgrown its local position, and for many years had been visited by numerous people from at home and abroad. Latterly the increased interest in practical bird-protection led to so many claims being made on the station that Baron von Berlepsch was quite unable to cope with them. The work that had such a good foundation, and was progressing of its own accord, would have been hindered in its natural development if the Royal Prussian Government had not come forward to assist this enterprise, which was for the common good.

The ornithologist, Friedrich Schwabe, was therefore appointed on April 1st, 1909, to assist and represent Baron von Berlepsch. His work consists in carrying out experiments and observations under the direction of his chief in all matters having to do with bird-protection, and in making them generally known, in answering official and private enquiries, instructing and acting as guide to visitors, and—as far as his time allows—giving lectures in other places.

(c) Courses of Instruction in Practical Bird-Protection.

One of the most essential points is the arrangement of special courses on bird-protection, which include not only theory but more especially practical instruction in all its branches. They are held in winter. The dates are announced in advance every year. They are arranged like the lectures for fruit-culture. Length of course, five days. Instruction in bird-protection can be given at Seebach at other times, apart from these lectures. Satisfactory board and lodging can be obtained at the Seebach Hotel. All the rest is free.

In the autumn of 1908, the first courses were held, with an attendance of twenty-four gentlemen. The first two courses were under the personal superintendence of Baron von Berlepsch. This forms a unique incident in the history of bird-protection, and is highly significant for its future development. Instruction in bird-protection! Who would have dared to hope for this a short time ago? The institution has been welcomed on all sides as the surest way of encouraging and promoting those measures which alone ensure success.

(D) *Visit to the Station.*

We cannot too strongly recommend a visit to the Seebach station, so that visitors may not only see for themselves how appropriate are the measures adopted, but may also judge of their efficacy. The visit can take place at any time. The best time is from the middle of November, after the fall of the leaf, to the end of the winter pruning at the end of February and beginning of March. At this time the method of pruning and the treatment of the bare trees can best be observed, and it is easier to find the numerous nests, which are the surest proof of the correctness of the methods adopted.

The station is divided into two parts, lying separate from each other. The plantations on the home estate itself, and the wood lying ten kilomètres distant, near Kammerforst.

The most important objects are at Seebach, especially the collection of woodpecker holes and the material for artificial imitations (von Berlepsch's nesting-boxes), all the bird shelter-woods and other plantations used for bird-protection and supplied with nesting-boxes, the various arrangements for winter-feeding, and the traps for vermin. The wood, with deciduous and coniferous trees, illustrates particularly the measures to be used in woods for bird-protection.

The following hints will enable visitors to make their arrangements beforehand :—

The thorough inspection of the Seebach plantation requires five to six hours; the wood, including drive or walk there and back, requires at least as long. The whole, therefore, according to the time of year and length of the day, takes one to one-and-a-half days. Seebach is a station on the Gotha-Leinefelde line.

The wood can be reached from Seebach on foot or from Mühlhausen in a carriage in two hours. The carriage should be ordered the day before. The station will undertake this if desired.

These directions will enable visitors to determine beforehand the most suitable time for their arrival and the length of their visit. They are requested to let the station know as early as possible the day and hour of arrival and whether they wish to inspect only the Seebach station or also the wood. Four days' notice would be best, as this makes it possible to acknowledge the receipt of the letter. Only in

this way can the head of the station be at the disposal of every visitor during the whole of his stay.

Board and lodging can easily be obtained in Seebach as well as in Kammerforst.

Clothes suitable for encountering wet and thorn-bushes are recommended. High boots or gaiters. The head of the station will give any further information.

All letters are to be addressed: "Versuchsstation für Vogelschutz, Seebach, Kreis Langensalza."

Telegraphic address:—"Vogelschutz, Seebach, Kreis Langensalza."

We would urge all governments, local authorities, societies, and private individuals who wish to carry out successfully the protection of birds to make full use of this opportunity. In the interest of the good cause we ought to be grateful for the opportunity afforded us of seeing with our own eyes what has been done, in addition to using the excellent books on this subject, so that time and money need no longer be wasted in useless experiments.*

This account of the experimental station at Seebach will be followed by a description of the measures taken by Baron von Berlepsch to introduce a rational system of protecting birds. They are as follows:—

1. Creating opportunities for breeding (*a*) for birds that build in holes; (*b*) for birds that build in the open.
2. Winter feeding.
3. Fighting the enemies of birds.

Actual success can only be attained by carrying out these measures in close connection with each other. One measure may perhaps be of greater importance than the other. None of them must be neglected, or the result of our efforts will be incomplete.

* The author considers it advisable, in view of various incidents, to draw immediate attention to the necessity for close observation of the Berlepsch measures. No good is effected by superficial treatment, which does not make clear the actual nature of these arrangements, of which the smallest detail is important. This superficiality leads to very serious mistakes in descriptions of the Berlepsch system for the protection of birds. Success in protecting birds is the result of close study of what seem to be the veriest trifles, such as Nature herself prescribes.

SECTION II.

THE PROTECTION OF BIRDS IN PRACTICE.

THE CREATION AND MAINTENANCE OF OPPORTUNITIES FOR NESTING AS THE CHIEF REQUIREMENT.

ALL experts are fully agreed that the most important step for bringing about the successful protection of birds consists in establishing suitable conditions of life, and, above all, opportunities for building nests. Without suitable breeding-places the healthy development of bird-life is arrested at the very outset, in spite of laws for the protection of birds and all other efforts. It is an established fact that birds will not breed at all if they cannot find a suitable place for their nests, or they make use of makeshifts, which cause the destruction of their broods.

Baron von Berlepsch says the same thing when he writes :—" We can only preserve and increase our birds in the long run by restoring to them the necessary conditions of life—above all, the opportunities for nesting of which we have robbed them."

The truth of these words and their practical application have been clearly and conclusively proved by him at his experimental station at Seebach. He has succeeded by means of untiring investigations and observation in establishing the most suitable conditions of life for our birds, especially opportunities for nesting for those which build in holes, as well as for those that breed in the open.

CHAPTER I.

THE PROVISION OF NESTING-PLACES FOR BIRDS BREEDING IN HOLES.

(A) *Nesting Difficulties.*

BIRDS building in holes are those birds that breed and spend the night in holes in trees, or more rarely in holes in rocks or other cavities. According to a list of European birds breeding in holes, drawn up by Baron von Berlepsch, we distinguish between those that do not build their nests in regular holes in trees with a narrow opening, but rather in niches and in narrow, half-open cavities, and those which breed in deep cavities with a narrow opening corresponding to the size of their bodies. In the first category are (1) black redstart; (2) spotted fly-catcher; (3) pied and white wagtails; and occasionally (4) the robin. Of large birds (5) kestrels; (6) jackdaws; (7) various species of owls. Nos. 5, 6 and 7 also frequently nest in regular holes.

In the second category we have: (1) tits—(a) great tit, (b) blue tit, (c) coal-tit, (d) marsh-tit, (e) crested tit, (f) willow-tit; (2) nut-hatch; (3) tree-creeper; (4) woodpeckers—(a) lesser spotted, (b) middle spotted (*Dendrocopus medius*), (c) great spotted, (d) Syrian (*Dendrocopus leuconotus*), (e) three-toed (*Dendrocopus tridactylus*) (f) grey (*Picus viridicanus*), (g) green, and (h) black woodpecker (*Picus martius*); (5) wryneck; (6) starling; (7) common redstart; (8) pied fly-catcher; (9) hoopoe; (10) swift; (11) roller; (12) stock-dove; (13) various species of owls; (14) kestrel; (15) jackdaw [Nos. 13, 14, and 15 are also in the first category]; (16) merganser (*Mergus merganser*); (17) white-collared fly-catcher.

The difficulty experienced by these birds, which are so important to agriculture and forestry, in finding nesting-places, has greatly

increased since by the rules of modern forestry nearly every old tree is felled without regard to the fact that the holes it contains serve as shelters and nesting-places for the most faithful friend of the agriculturist and the forester. Man, who nowadays cares only for what is of practical use, is short-sighted enough to grudge the old, decayed trees the little space on which they stand. In the woods, as well as in the orchards, he frequently lays too much stress on the utilitarian principle, but unfortunately in the wrong direction.*

As, in consequence, the natural nesting-places of the breeders in holes became more and more rare, it had long been a problem how the deficiency could be supplied, but unfortunately the problem was not very successfully solved. We have no space to describe in detail the many experiments and failures which took place in the course of time in the matter of nesting-boxes. There could be no question of genuine success, simply because the boxes were not in accordance with nature, but were mere inventions. The well-known naturalist, Alfred Brehm, was perfectly right when, twenty years ago, he maintained that the nesting-boxes then in use were totally unsuitable.

(B) *Origin of the Berlepsch Nesting-boxes.*

As a boy of fifteen, Baron von Berlepsch had already noted in his diary that the nesting-boxes then in use served no purpose, and that the only chance of success lay in the boxes being made to imitate Nature, so that the birds should settle in them as they would in natural cavities.

Twenty years later he solved the problem. After years of observation he established the fact that the nesting-holes which the birds preferred were deserted or uninhabited woodpecker holes. This led him to conceive the idea of continuing the work of the woodpecker by the hand of man, that is to say, of making close imitations of the woodpecker holes which, unlike the existing nesting-boxes, should be no mere inventions, but exact copies of Nature.

* Fortunately, a change for the better has lately taken place in Germany in this respect. The Government officials have already recognised the fact, and have ordered that the old trees shall be left standing in the crown woods. It is to be hoped that the good example of the State may be followed by local authorities as well as by private proprietors. A very beneficial influence can be exercised by the ranger in this matter.

He made use of every opportunity of carefully examining woodpecker holes, though his work was often attended with considerable difficulty, because the tree in question had to be felled and cut up so that its interior might be thoroughly examined. Without in the least anticipating the true state of affairs, he was actuated simply by the wish that his investigations might lead to the discovery of principles which he could follow in the construction of a nesting-box which should be generally useful—a box, in short, which would take the place of the natural woodpecker's hole in every respect.

To his surprise he discovered after examining several hundreds of woodpecker holes, that they were all formed on a uniform plan. All the holes of the black, green, and grey woodpeckers, as well as those of the various spotted woodpeckers, in spite of difference in size, were constructed on exactly the same principles. The problem of a satisfactory nesting-box was brought very much nearer its solution by this important discovery. It was now merely a question of producing an imitation of these woodpecker holes, which should be true to nature and serve the generality of birds, and the problem was satisfactorily solved after many failures.

(c) *Manufacture of the Nesting-boxes.*

There were many difficulties connected with the imitation of the peculiarly-shaped woodpecker holes, as they were to be faithfully copied, down to the smallest details. The accompanying illustrations, taken from photographs of the longitudinal sections of natural woodpecker holes, show clearly the method of their construction.

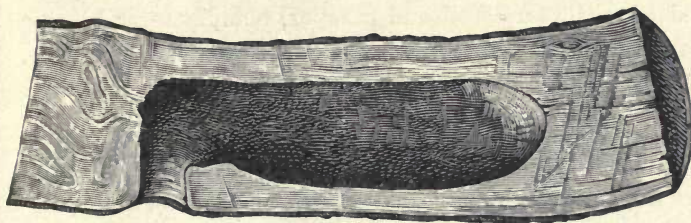
The opening is always circular, and is of unvarying size with each species, *i.e.*, with the lesser spotted woodpecker, $1\frac{1}{4}$ inch; the greater spotted woodpecker, $1\frac{3}{4}$ inch; the green woodpecker, $2\frac{3}{8}$ inches; the black woodpecker, $3\frac{3}{8}$ inches.*

A very important point has been observed, namely, that by a wise provision of Nature the opening of all the holes is inclined upwards to a certain angle (4 deg.) in the interior, so that the rain cannot penetrate.

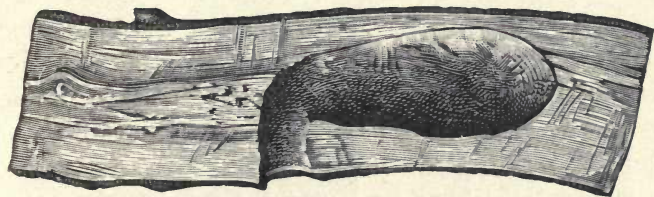
* The measurements of the holes of the black woodpecker are correct when the openings are round. When they are more or less oval, as is often the case, especially in eastern Europe, the horizontal diameter is smaller, and the vertical diameter is longer than is stated above.



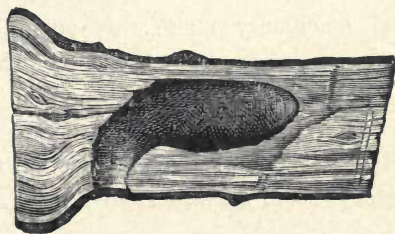
D



C



B



A

LONGITUDINAL SECTIONS OF WOODPECKER HOLES.

- A.—Lesser Spotted Woodpecker.
B.—Greater Spotted Woodpecker.
C.—Green Woodpecker.
D.—Black Woodpecker.

(One-eighth natural size.)

The lower part of the breeding cavity itself is enlarged bottle-shaped, and ends in a pointed oval trough at the bottom. The inner walls are somewhat uneven, so that the birds can cling to them more easily. In the extreme point of the nest trough a little mould or fine shavings that have been chiselled off serve for the eggs to rest on.

The walls of the cavities are in every instance so strong that atmospheric changes have no effect on the interior. The Berlepsch nesting-boxes are exact reproductions of these woodpecker holes. At first they were made by hand, with special instruments. But this method of reproduction was so troublesome, and therefore so expensive, that the general public derived little benefit from it. Matters were not simplified till an experienced and practical manufacturer became interested in reproducing the artificial woodpecker holes wholesale, and not till then could the problem of nesting-boxes be considered solved.

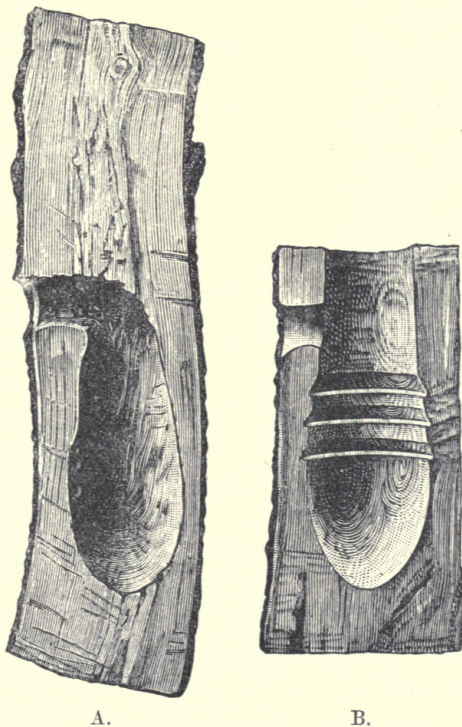
Mr. Hermann Scheid, in Büren (Westphalia), is the man whom Baron von Berlepsch induced to help in his plans for the production of nesting-boxes, as well as of the other articles connected with the protection of birds. Mr. Scheid who, from childhood, had loved and studied birds, devoted himself exclusively and with great energy to the undertaking, which at first seemed somewhat risky. I am quite justified in calling the undertaking risky for a manufacturer, for everyone who knows Baron von Berlepsch will agree that it is not exactly easy to satisfy him, and only those can claim to have satisfied him who have carried out his demands and wishes to the veriest detail. True to nature, durable and cheap at the same time, was the watchword for the manufacturer.

Complicated machinery made this possible, and as the success which resulted everywhere from the use of the boxes was their best recommendation, they achieved their present reputation much more quickly than was anticipated. The great and steady increase in their use obliged Herr Scheid to provide, in addition to his factory at Büren, a similar factory at Mühlhausen, in East Prussia.

We must not omit to mention that at the instigation of the Hungarian Ornithological Bureau these boxes are manufactured faultlessly in Austro-Hungary, in special factories under State management.

(D) *Description of the Nesting-boxes.*

These nesting-boxes are exact copies of woodpecker holes, as we have already stated. Compare the accompanying illustrations of longitudinal sections of natural and artificial holes. A closer description of the boxes, the different measurements, the position of the opening, the boring and arrangement of the interior, can be given more clearly by the



LONGITUDINAL SECTIONS OF

A.—Great Spotted Woodpecker's hole.

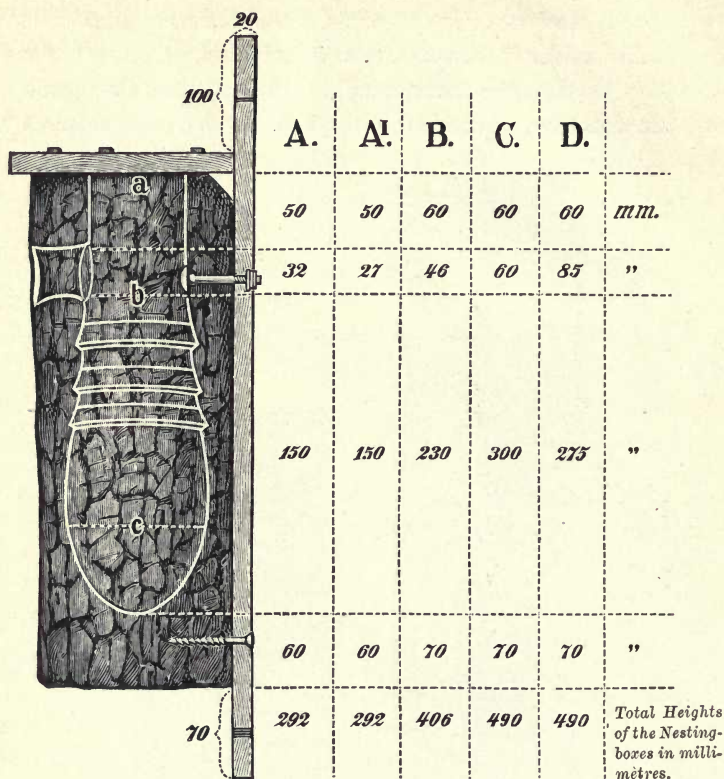
B.—Berlepsch's Nesting-box, size B.

(One-eighth natural size.)

following diagram accompanied by a scale than would be possible by a verbal description. The figures of the first division denote the space between the lid and the opening; those of the second the diameter of the opening; those of the third the depth of the boxes from the lower

edge of the opening to the deepest point of the nest trough; and those of the fourth the thickness of the bottom.

The following are the measurements in millimètres of the diameters



of the inside of the nesting-cavities at the various points as indicated in the above diagram :—

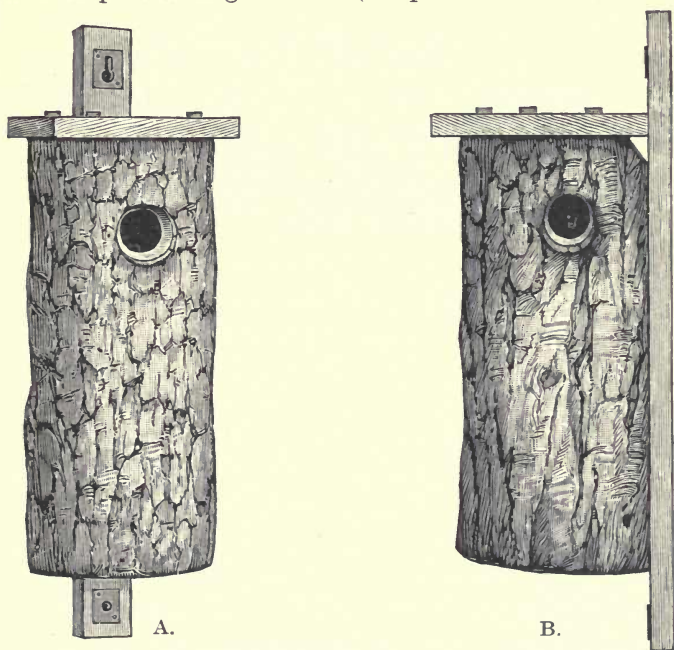
Nesting-Boxes—

	Size A.	A1.	B.	C.	D.
At A.	60-65	60-65	80-85		
„ B.	70-80	70-80	85-95		
„ C.	85-95	85-95	115-125	160-180	160-180

These boxes are made of alder, birch, pine, and other woods which do not split easily.*

* Many boxes were made of birchwood. Baron von Berlepsch has forbidden the use of this wood in future as it is not very durable.

The most important thing next to the characteristic slope of the opening at an angle of 4 degrees is undoubtedly the pointed oval form of the trough. Strange to say, this most important circumstance is frequently misunderstood. A mistake of this kind, such as speaking of a flat trough, can only be the result of insufficient acquaintance with the Berlepsch nesting-boxes.* (See p. 32.)



EXTERIORS OF BERLEPSCH'S NESTING-BOXES.

A.—With entrance hole opposite batten.

B.—With entrance hole at the side.

The cover and the batten consist of oak $\frac{3}{4}$ inch thick, and, as the illustration shows, the former is fastened to the box by screw bolts. The batten is provided with a hole for a nail above and below the box and each is protected by a strong iron plate. These iron plates are a very great improvement, because they prevent the batten from splitting, or the nail from sinking in, accidents which were formerly of frequent

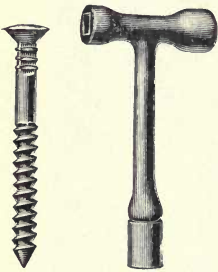
* In one of the first editions of the "Gesammte Vogelschutz" the word "flat" was wrongly printed for "pointed" trough. We must assume that this mistake was copied by those who were not acquainted with woodpecker holes, and that the error was thus spread.

occurrence owing to the growth of the trees. The upper hole has the shape shown in the accompanying illustration, to make the hanging of the boxes more convenient.



A very great improvement was recently effected by the slope introduced in the angle between the cover and the batten. In spite of all the advantages it was found impossible to prevent rainwater from occasionally entering the interior. This unfortunate state of affairs was especially inevitable when the boxes hung just where the tree formed a gutter—a thing that cannot always be avoided, because it is not noticed beforehand. The slope, however, conducts

the water that flows down the batten, directly away from the interior of the box, which is kept dry by this means.* If in spite of this the wet penetrates into the interior during heavy down-pours, Baron von Berlepsch has given instructions that a vertical hole of about 3 mm. is to be bored in the trough. This hole is covered and filled up by the mixture mentioned on pp. 43-4, but it is quite sufficient to drain off the moisture. Besides, a hole of this description



Screw nail. Key.

corresponds to what we find in the natural hole, where the moisture drains off into the rotten core.

The opening is sometimes opposite the batten, sometimes at its side.

The “screw-nails” which are used to fasten the boxes, are better than ordinary nails, because they need not be driven in so far, and yet are very firm, owing to their peculiar twists. (*See illustration.*)

A key is necessary to tighten the screw-bolts of the cover and the batten, which are often loosened in transit, or to enable one to remove the cover in order to see the interior of the box when it is hanging up. (*See illustration.*)

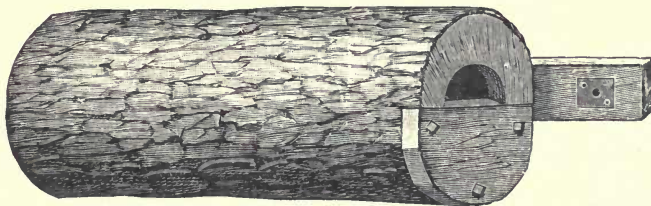
(E) *Kinds of Boxes.*

Five different kinds of Berlepsch’s nesting-boxes, resembling each other in construction, but differing in size to correspond with woodpecker holes, are manufactured.†

* Baron von Berlepsch, much to our satisfaction, has at last consented to patent this and all recent improvements. It will be found only in the nesting-boxes that also bear the trade-mark. (*See p. 42.*)

† For prices and particulars as to where these and the other appliances recommended can be obtained, *see* advertisement pages at the end of this book.

Box A is suitable for the great tit, blue tit, marsh-tit, coal-tit, willow-tit, crested tit, nuthatch, tree-creeper, wryneck, pied fly-catcher, redstart, lesser spotted woodpecker. In accordance with the wish of many who are interested in the matter, and suffer greatly from the plague of sparrows, a box called A1 has lately been made with a narrower opening—1 1-16 inch. It is designed for blue tits, marsh-tits, coal-



NESTING-BOX E.

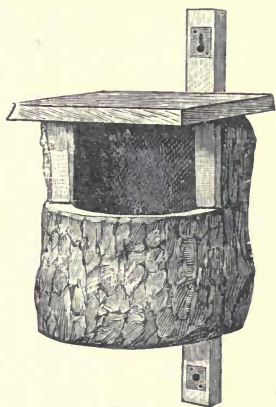
tits, and crested tits; sparrows cannot enter it, but neither can other birds, except the small tits, not even the great tit.

Box B is for starlings, greater spotted woodpeckers, wrynecks, nuthatches, pied fly-catchers, redstarts, great tits. The last five species settle in box A as well as in B. The former suffices as a rule.

Box C is for green woodpeckers; and Box D for stock-doves,* kestrels, jackdaws, and owls.

For the sake of completeness we have box E for swifts, with the boring of box B, and a semi-circular opening. (See illustration.)

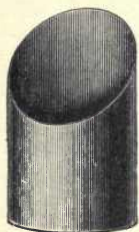
The open box F has a diameter of about $4\frac{1}{4}$ inches, and a depth of about $2\frac{1}{4}$ inches. It is made for such birds as redstarts, spotted fly-catchers, and pied wagtails, and also for robins.



NESTING-BOX F.

* I should like to awaken interest in pigeon preserves, such as were common in Germany in the seventeenth and eighteenth centuries, when these birds afforded a pleasant addition to the menu. It would be a good plan to hang a number of boxes in close proximity to each other in suitable districts where the stock-dove is already found. The most suitable places, it seems to me, would be preserves for game where the necessary protection from interference and poaching is already to be found.

The following are also to be had for use with the boxes: key, screws, bag with mixture of earth and sawdust for putting into the box (everyone can make this mixture for himself), and a measure for putting in the right quantity. If any of the boxes are to be hung on trees with very strong bark that is liable to split (old oaks, poplars), it is better to mention the fact when ordering, so that a suitable number of long nails may be sent.



MEASURE FOR
THE EARTH
AND SAW-DUST
MIXTURE.

The prices of the nesting-boxes are certainly very moderate when we consider how difficult they are to make and how lasting they are. These prices are only possible because they are produced in large quantities. But this is the fundamental principle of the undertaking, namely, that everyone may be able to obtain them.

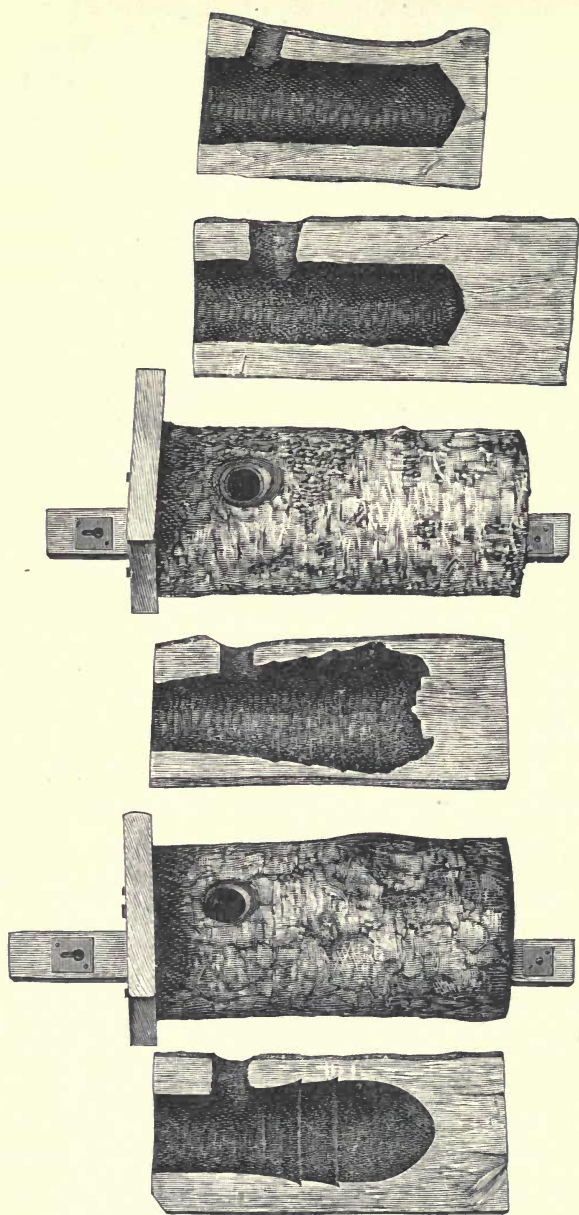
(F) *Advice regarding Nesting-boxes.*

Unfortunately, Baron von Berlepsch refused to obtain legal protection for his nesting-boxes, by means of either patent or trade-mark. He treated the matter from an ideal, but mistaken point of view, and thought he was serving the good cause, and that he would soon see nesting-boxes made and used everywhere, in accordance with his directions, but he was thoroughly mistaken. It is true that Berlepsch's nesting-boxes (so-called) appeared everywhere, but the imitations have nothing in common with the originals except the name, and they can be described for the most part as entirely worthless.

The name and the illustrations which are intended to mislead are printed in circulars without hesitation. Generally the fraud has been carried out so skilfully that only in very few cases has it been possible to reach these unscrupulous tradesmen by means of the law.

It is exceedingly easy to cheat in regard to nesting-boxes, because outwardly they all bear a fair resemblance to each other, and they can only be properly tested if they are opened and sawn asunder lengthwise. Compare the figures in the accompanying illustration made from photographs.

On the left are complete nesting-boxes, and a section of one by Scheid; on the right are boxes made by other manufacturers. The exterior



C.

B.

A.

A.—CORRECT NESTING-BOXES. B AND C.—WORTHLESS IMITATIONS.

of the boxes is much the same, but what do we find when we compare the interior, the boring, position of the opening, etc.? At the bottom of one box there is such a lump that it could not possibly be inhabited by any bird. The box is very carelessly wrought in other respects. It is hollowed out, as the illustration shows, to the outer shell, so that the wall could be pressed in by the finger, and the boxes on the right show distinct signs of dishonest workmanship. They also seem correct from the outside: size, opening, everything coincides. Here is box B for starlings, but pierced with the same borer as A—the box for tits. It is simply a fraud, for the birds for which it is intended cannot get in at all. The Commission sent for three specimens of each of these boxes. Those shown here are the worst, it is true, but the others were not much better. It is very plain that the unfortunate owner of such a box has little to hope for from its use.

These are only two instances out of many, so that we need not be astonished that there are still so many failures. Fortunately, we are still in a position to attack this dishonest way of doing business by a step which will protect every purchaser directly from being cheated, and hence from injury. Baron von Berlepsch has had the trade-mark here shown duly registered, and up till now has allowed only the manufacturers, Scheid and Bertschinger, to make use of it, and in addition, these two firms are the only ones who are allowed to introduce the improvement described on p. 38.



REGISTERED TRADE-MARK.

It is therefore to the interest of every purchaser to make use of only such nesting-boxes and other appliances for the protection of birds as bear this trade-mark. The "Commission for Encouraging the Protection of Birds" urgently requests all who are interested to act accordingly.

It is time that people realized that it is not a question of hanging up any sort of nesting-box, but one that carries out the established principles in every detail, *i.e.*, which corresponds in the minutest detail with a natural woodpecker's hole. If this were not so it would seem strange that before Baron von Berlepsch took up the matter we did not

obtain similar results to his. Success in protecting birds depends on apparent trifles, such as Nature prescribes for us. Only the firm of Scheid works under the immediate and direct supervision of Baron von Berlepsch. After an experience of twelve years we can give a final opinion about the articles manufactured by this firm, and we must describe its work as excellent.

But it is by no means impossible, seeing that the articles are turned out in this wholesale fashion, that occasionally an imperfect specimen may be found, and we therefore beg that purchasers will sometimes test the goods with the help of this book. The firm mentioned has pledged itself to take back, within eight days (carriage not paid by sender), any article that is in the least faulty, and to send back another free of charge.

When large quantities of nesting-boxes are required, they should be carefully selected. The following chapters will show that in most cases boxes A and B should be chosen, because the birds which inhabit them are those whose presence is most desired.

(g) *Hanging up of Nesting-boxes.*

Even if these nesting-boxes are perfect in construction, success still depends on the way they are hung up ; some important rules concerning this point will therefore be given here.

Before hanging them, tighten the screws of the lid and the batten which may have been loosened in transit, by means of the key (p. 38), and give a few blows with a hammer to the nail which connects the batten with the box.

Then, in place of the tree-mould found in natural holes, put into every box a mixture of sawdust and earth in equal parts, which can either be obtained from the manufacturers at the same time as the boxes or can be made by the purchaser himself.

Unfortunately, people are often misled by the saying, which is true enough of other things : "The more the better" ; but if too much is used the pointed oval trough loses its value for birds that use little or no material for their nests, such as the wryneck, woodpecker, and stock-dove, because it is no longer true to Nature.*

* The advantage of the pointed trough lies in its keeping together the eggs of those birds that do not build nests. If the trough is filled too full this advantage is lost, and the box is as useless as one with a flat bottom. (See p. 41.)

The quantity of earth and sawdust to be put in has been exactly ascertained. In box A put $\frac{1}{10}$ litre (= about 1 oz., or a tablespoonful); in B, $\frac{1}{20}$ litre (= about 2 oz., or two tablespoonfuls); in C and D $\frac{1}{4}$ litre (= about $8\frac{3}{4}$ oz., or $1\frac{3}{4}$ gills).

As it is so important to put in the right quantity, it is better to make use of the measure, which can be obtained from the manufacturers, and is well adapted for filling in the mixture. For box A fill it once, for B twice, and for C and D ten times.

On the whole, in consideration of what we have said above, it is wiser to follow the rule: "Better too little than too much."

With regard to hanging up the boxes we must consider (1) the season; (2) the position; (3) the method of hanging them up.

1. The late autumn is the most FAVOURABLE TIME for hanging them up, so that the birds that winter with us may find shelter there. But these nesting-boxes can be put up during the whole winter, till March, with a good chance of success. Boxes put up later are very rarely inhabited in the same year.

2. With regard to the POSITION, the most useful are as follows: Boxes A and A1 should be from 6 to 13 feet from the ground, on trees, props, walls, etc., in orchards, woods, and plantations, especially in young plantations, in a quiet spot protected somewhat by bushes, and if possible hidden by overhanging branches.* In woods, especially coniferous woods, it is better to begin at the edge (but not at the extreme edge) with trees that stand back 3 to 6 feet and to leave some 30 paces between each (*see pp. 46 and 47 for reason*). When sufficient have been hung at the edge of the wood, the boxes must be gradually introduced into the interior, especially in clearings, such as are often caused in pine woods by snow and wind, or by local attacks of fungoid diseases. Birds that breed in holes, like birds that breed in the open, avoid very dark spots.

Box A is for great tit, blue tit, marsh-tit, crested tit, coal-tit, tree-creeper, pied fly-catcher, wryneck, common redstart, lesser spotted

* If there is any fear of injuring young trees by knocking in nails, the boxes should be fastened to posts. In young plantations where there are no nesting-holes, it is both easy and desirable to bring about a settlement of very useful birds in this fashion. Boxes fixed at a distance of about 3 feet from the ground are inhabited by tits, as may be seen at Seebach. These low-hung boxes have this advantage, that they are neglected by the sparrows. This method can only be recommended where there are no vermin.

woodpecker, nuthatch. Box A1 is for blue tit, marsh-tit, coal-tit, crested tit, and for these only, and they are perfectly safe from sparrows, and should therefore be used everywhere where sparrows are troublesome.

Box B must be fixed 12 to 16 feet from the ground, on trees, buildings, etc. It is mostly inhabited by starlings,* and also by the greater spotted woodpecker, in woods, plantations, avenues, and gardens, and the birds named for A.† If these boxes are hung chiefly for starlings they can be put quite close together, several on a tree (for reason see pp. 46, 47).

Box C should be placed from 6 to 50 feet above the ground, near cattle pastures and marshy lowlands, in plantations of fruit trees, in avenues, and in woods. It will be used chiefly by the green woodpecker.

Box D must be put high up on trees in woods, parks, etc., for stockdoves, kestrels, jackdaws, and owls. It is advisable to put two or three boxes close together for stockdoves.

* People are often afraid of encouraging starlings to settle for fear that they may later on injure the fruit, especially cherries. This is quite a misconception. It is perfectly true that the starlings do a great deal of damage when united in large flocks, but it has been proved that those are not the starlings that breed in the neighbourhood.

There is one phenomenon that has been observed in starlings and other birds: they only stay for one or one-and-a-half days in their breeding-place after the young are fledged. Then they go many miles away in great numbers and form the large flocks which are so dreaded. It is not, therefore, the starlings bred in the neighbourhood, but strange starlings which do so much damage to the fruit growers. The following two observations will confirm this statement:—

Kammerforst (Langensalza) possesses extensive cherry orchards, which immediately adjoin the wood of Baron von Berlepsch, where at least 1,000 starlings annually breed in the nesting-boxes. In spite of this, no complaints have ever arisen concerning the cherry orchards, as the local authorities will bear witness. The birds have left long before the cherries are ripe.

This confirms the Baron's observation that starlings have only *one* brood. All so-called second broods of starlings according to him are the result of unsuccessful first broods, and this is confirmed by the fact that these second broods are only found in isolated cases.

The opposite may be seen in the district of Lake Mansfeld. All efforts to make the starlings settle there have failed. No young starlings have been seen there in spite of apparently favourable conditions. After the breeding season and during the whole of the summer very large flocks are to be found there; during the day they besiege the cherry avenues and in the evening they settle in great clouds in the reed plantations of Lake Mansfeld.

† It is a very common error that tits prefer boxes with small openings. Experience has repeatedly proved that where boxes A and B are placed side by side at the same distance from the ground, box B is preferred by the tits.

Box E, half-filled with a little nesting material, such as small feathers (best of all torn sparrows' nests), should be fastened on towers and high buildings, for swifts.

The open box F may be fixed at a height of from 6 to 13 feet above the ground, on isolated trees, verandas and walls of houses, for the spotted fly-catcher, at a greater distance from the ground, on gables if possible, for pied wagtails. Distance between boxes 20 to 30 paces.

The foregoing remarks show that as a rule it is advisable to place only one box on each tree and to hang the boxes at a distance of some 30 paces. "The distance between the breeding pairs depends on the kind of food and especially on whether they seek it near their nest or at a distance.

"As birds of the same species always eat the same kind of food, they cannot live very close together without risk of want, if, like most insectivorous birds, they seek it near the nest. Each pair requires sufficient hunting ground round its home to satisfy its own needs and those of its brood. Among the birds that breed in holes starlings, roller, stockdoves, kestrels, swifts, jackdaws, and merganser must be excepted from these remarks. It is true individual members of each separate species use the same food, but the birds do not seek it near the nest, but at a considerable distance from it. They often go some kilomètres, scatter in all directions, and probably never interfere with each other. The members of the same species can therefore live near together

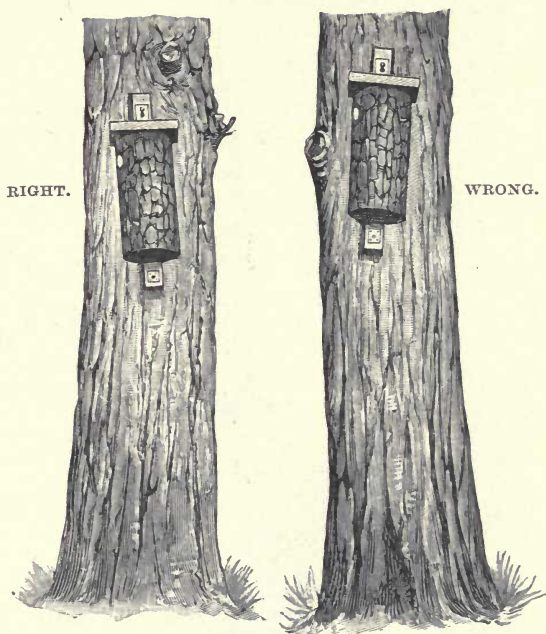
"Birds of different species as a rule live peacefully together. As each species uses more or less distinct food, different kinds of birds do not interfere with each other, even if they seek their food near their nests in the same districts."

On the whole it is better to distribute the boxes at one's disposal equally over the district, beginning in the case of box A and A1 at the edge of the woods, parks or other plantations. If they hang rather far apart at first, others can be added later on. The above directions must also be carried out on large estates of many thousand acres, even if at first the boxes are widely scattered.

Two boxes per acre is the minimum for estates of this kind, *i.e.*, eight per hectare. If the number is less, we can scarcely reckon on indirect results, such as a decrease of grubs. We may add that it is not necessary to hang up two boxes on every acre. This is to give

the average number of boxes hung over the whole area. Here, again, the boxes must be hung more thickly on the edges of the woods and the well-lighted spots than in dark places where the growth is dense. In certain circumstances, unsuitable places of one or more acres have no boxes, and a correspondingly large number is hung in more favourable spots.

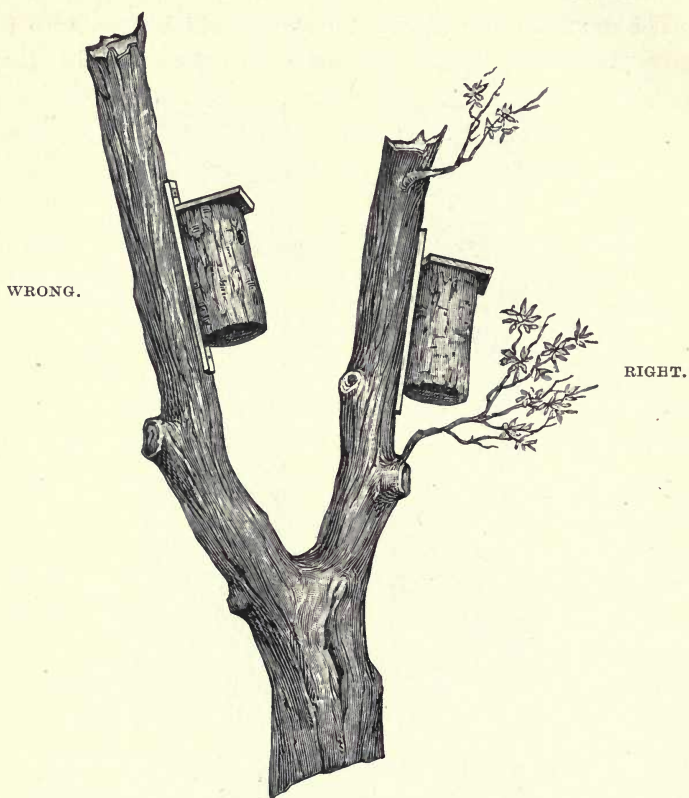
3. The METHOD of hanging the boxes will be best seen in the accompanying illustrations. The boxes are rightly fixed if they are



hung vertically, or with the upper part projecting a little in the direction of the opening, and the opening facing the east or south-east.

The boxes are badly hung if inclined towards the side away from the opening, or if the opening faces the weather-side. Boxes hung in this way are, it is true, adopted by birds; the openings of natural holes are found facing every direction. But the rain easily penetrates into these boxes and the young broods perish. We find proof of this in natural as well as artificial holes. No harm results if the box is inclined a little less to the right or left side. The side with the opening must always be considered as the front. It must

be understood clearly that by inclining the box backwards—that is to say, in a direction opposite to the opening—the direction of the slope of the opening is neutralized, and rain can penetrate. (See p. 32.) They must be so fastened that they cannot shake, as otherwise the birds will not readily settle in them. The best means



of fastening them is with the screw-nails (p. 38), and the easiest manner of doing this, especially with the bigger and heavier ones is as follows : A screw-nail must be knocked in at the chosen spot, just so far that its head projects over the batten of the box, which is to be hung up—the screw-nail must therefore project more than $\frac{3}{4}$ inch out of the tree ; the box must then be hung up on it (see p. 36), and the screw-nail finally hammered in.

There has always been a difference of opinion as to the *cleaning of the nest-boxes*. Professor Liebe thought that it was actually harmful to clean the boxes. That may have been the case with the unnatural boxes of those days. A comparatively long time always elapsed before such a box was used at all. It had to become old and the birds had to grow used to it. This was undoubtedly simplified if it contained an old nest.

We have changed all this. The von Berlepsch boxes now in use—a faithful copy of natural woodpecker holes—are at once fearlessly occupied by all birds, even when quite new, and experience has shown that the last hung up and the newest are preferred. The old nest is therefore no longer required for the above purpose. But as some nesting boxes are lost for the next breeding season because they contain dead birds, insects, or something that the bird dislikes, we should not hesitate to clean the boxes where possible.

It is, of course, often impossible to do this, as when boxes C and D and probably B are hung too high, when there are too many, or when there is no competent person to carry out the work.

The boxes must be opened for cleaning, and for this purpose the screws of the lid must be loosened with a key and afterwards tightened again. It is very likely that more harm than good will result from this treatment.

On the Seebach experimental station a new method of hanging up the boxes is being tested, which will enable us to take them down and hang them up again at will. The favourable results hitherto experienced will probably lead to the general introduction of this arrangement, which will make a thorough cleaning much easier.

When the boxes are cleaned the bottom layer of mould ought also to be removed, as it is there that mites and other vermin chiefly collect, but it must be replaced in accordance with the measurements given on pp. 43-4. If bats have taken possession of the boxes, they should not be disturbed. They are as useful as the birds. The boxes are fulfilling the purpose for which they were hung. New boxes must be hung beside them.

(H) *Successful results of the Berlepsch Nesting-boxes.*

Wherever these nesting-boxes have been hung up a great success has been the result. All the breeders in holes (*see p. 30*), and for the last

three years the black woodpecker even, have inhabited them; while the boxes of earlier days were only used by a few species, and very rarely at that. The author was able to convince himself that 90 per cent. of the 2,000 boxes in the wood at Kammerforst (part of the Seebach experimental station), and nearly all of the 500 at Seebach, and of the 2,750 near Cassel,* were occupied by various species (*see* pp. 24 and 25 for exact list of birds). The Prussian Board of Agriculture has caused extensive experiments to be made with these boxes, with excellent results, as published documents affirm.

Of the 9,300 boxes hung up by the Government in the State and Communal woods of the Grand Duchy of Hesse, 70 to 80 per cent. were used the first year, and all have been inhabited since then. The value of this nesting-box compared with those of other makes is proved, among other things, by a letter sent me from Wilmersdorf, near Berlin, in which I am informed that for five or six years unsuccessful experiments were made with other boxes, but that the von Berlepsch kind, which were then hung up, were all occupied at once. The same favourable results are reported by numerous official departments, societies, and private individuals. It would take too long to enumerate them all here.

A few proofs must be adduced of the indirect results, that is to say, of the benefits derived from the use of nesting-boxes. It is not necessary to refer to the old problem regarding the number of caterpillars, chrysalides, etc., a tit eats daily, and how many pounds of caterpillars are in consequence eaten in a year by a whole family of tits, but I will give a few actual, recent examples of the benefits resulting from a judicious protection of birds, which I have taken from the material nearest at hand.

The Hainich wood, south of Eisenach, which covers several square miles, was stripped entirely bare in the spring of 1905 by *larvæ* of a little moth (*Tortrix viridana*). The wood of Baron von Berlepsch, in which there had long been nesting-boxes, of which there are now more than 2,000, was untouched. It actually stood out among the

* In Cassel a station for the protection of birds was established in 1900 on the model of that at Seebach, and it may now be considered complete. It is under the direction of the section "Vögelschutz," of the Hessian Society for the Protection of Animals. Major Henrici, Cassel, Weinbergstrasse 1, is ready to give any information and assistance that may be required.

remaining woods like a green oasis. At a distance of a little more than a quarter of a mile farther the first traces of the plague were apparent, and at the same distance farther on still it was in full force. It was a plain proof of the distance the tits and their companions had gone during the winter, and after their breeding time.

The case was so plain that Baron von Berlepsch considered it of sufficient importance to send a report to the Prussian Board of Agriculture in order that it might be placed on record. Similar observations were made during a plague of *Tortrix viridana* in 1906 in the Crown wood Harras, in the Grand Duchy of Hesse, where the protection of birds has been carried on in a sensible and energetic fashion during the last few years. The abundant use of nesting-boxes in the Prussian woods has, during the last two years, brought about in some places a sensible decrease in cockchafers and *Tortrix viridana* by means of starlings.

If we turn from woods to agriculture and fruit-growing, the experimental station at Seebach again affords an eloquent and well-authenticated testimony.

The same good fruit crops have been obtained for many years in those places which have been longest and most abundantly provided with nesting-boxes, and where most of the trees have grown up with the protection of birds. Although the whole neighbourhood frequently suffered from caterpillars, the trees, inhabited by tits and other birds nesting in the boxes, always escaped.

The inhabitants of the neighbouring village soon noticed this, and also began to hang up boxes. Now all the gardens are full of them, and the people maintain that since then the caterpillar plague has considerably decreased in their neighbourhood. It is worth noting that the inhabitants of that village are by no means specially fond of birds, but that the protection of birds is due solely to utilitarian purposes, the people having recognised the fact that the outlay for boxes was a very good investment.

These instances are established, irrefutable facts, and these actual experiences are undoubtedly more eloquent than all the learning displayed at the council board.

These nesting-boxes do not require any special recommendation; the facts speak for themselves.

I have heard frequent complaints that Berlepsch's nesting-boxes are

constantly attacked by woodpeckers. It certainly happens very often, but at the same time it is the best proof of the naturalness of these boxes. The natural holes of the woodpecker, the holes, that is to say, which the woodpeckers have themselves made in the tree, are treated in the same way, as may easily be seen in every old wood. The nesting-boxes formerly used were never attacked by woodpeckers, but—they were never inhabited by them.

The enlarging of the openings by squirrels, which has often been noticed, is also to be seen in natural woodpeckers' holes. But these injuries do not render useless either the real or the artificial holes which serve as dwelling-places for other birds, such as tree-creepers, spotted fly-catchers, redstarts, wagtails, robins, wrens, according to the degree of injury and the place where the box is hung. This has been frequently proved at the Seebach experimental station.

The lining of the openings with tin is in every way objectionable, as the natural appearance of the boxes—their chief merit—is destroyed, and such boxes are never inhabited by birds.

(1) *Cavities in Walls.*

Numerous birds build in holes in the walls of the old castle at Seebach. These opportunities for building nests, which are so eagerly made use of, are to be increased shortly by the formation of artificial holes in the thick walls, and extensive experiments are to be tried elsewhere. Nesting-places of this description can be made on the principle of the nesting-boxes by means of cement or other mortar.*

The cement "nesting-stones" manufactured by Scheid and others for building into walls provide dwellings for nesters in whole and half holes. They have not been tried long enough to enable us to pass a final opinion on their merits.

The nesting-places of clay and similar material which were formerly so often sold, and which are unfortunately still to be had, must be distinguished from the holes made in the walls themselves. The latter are not affected by the changes of the weather, owing to the thickness

* Nesting-places of this description have proved very valuable near Cassel. They were occupied by blue tits, crested tits, wrynecks, black and common redstarts, and all the broods were successful.

of the walls ; whereas broods that chanced to be hatched in the artificial stone or clay nesting-holes, with their thin walls, were exposed to abrupt changes of temperature, extremes of heat and cold, and were thus destroyed.

The Seebach Station has also experimented with the clay "nesting-urns," but they had to be used in conjunction with holes in wood, and not by themselves. The want of success that attended the experiments cannot, therefore, be regarded as conclusive until the urns have been used alone without any other nesting-arrangements, especially after a severe winter, for all nesting-holes, whether of wood or clay, must be tested not only for breeding purposes, but also as places for sleeping in winter. The old-fashioned clay "boxes," which were less deep, and had, like all the former boxes, a flat bottom (the interior of Schlüter's nesting-urns which we are discussing here, is an exact reproduction of the Berlepsch nesting-boxes), have by no means fulfilled the purpose for which they were intended, though their walls were much thicker, as was specially apparent during the severe winter of 1884-85. In the early spring there were found in them many tits, nuthatches, tree-creepers, and even several tree-sparrows and a robin, that had been frozen to death. In my opinion the use of the thin-walled clay-urns will have similar deplorable results. But in accordance with the von Berlepsch principle, only to state what has been confirmed by actual results, we are at present, unfortunately, not in a position to attack what will, without doubt, prove a source of great danger to our birds.

We should, however, like to make it quite clear to the amateur that even though very favourable results are obtained in the future, the clay "boxes" can never be more than a makeshift for the wooden ones for those breeders in holes that build nests. It is absolutely impossible that clay "boxes" should ever become a perfect substitute for wooden ones. We shall continue our investigations.

CHAPTER II.

PROVISION OF NESTING-PLACES FOR BIRDS BREEDING IN THE OPEN.

BIRDS breeding in the open are those that make their nests in bushes and trees, on the ground, on banks, among reeds, etc.

The want of opportunities for nesting is becoming more and more apparent as far as these birds are concerned, which include our best songsters, since there has been a perfect mania for destroying hedges and fences everywhere, for cutting down the undergrowth in woods and on the outskirts of woods, and for dividing fields, drying up swamps and ponds, and altering river beds.

Successful methods of providing nesting-places for such birds are also to be seen at the experimental station of Seebach, where extensive plantations have been laid out and treated suitably for the purpose. Special attention must be drawn to the fact that in these plantations the most important points are the correct choice of shrubs and their suitable pruning.

In the choice of the shrubs, those are specially considered which can bear pruning, and which branch out in consequence of being cut, which keep away vermin by means of thorns, thrive well in the shade, and are especially favoured by individual species of birds, as, for instance, the gooseberry, which is liked by the warblers. These bushes include especially white-thorn (*Crataegus oxyacantha* and *C. monogyna*), hornbeam (*Carpinus betulus*), common beech* (*Fagus silvatica*), dog rose (*Rosa canina*), wild gooseberry (*Ribes grossularia*), tall American gooseberry (*Ribes grossularia arboreum*)—a species of wild currant (*Ribes pumilum*) [*Ribes alpinum* has not proved satisfactory], privet (*Ligustrum vulgare*), the two varieties of *Lonicera* (*Lonicera xylosteum* and *Lonicera tatarica*) and of conifers, the red cedar and pollarded firs.†

* A lopped beech is specially liked for an early brood, because the nest can often be built in the old dry foliage.

† The Norway spruce (*Picea excelsa remonti*) is used at Seebach instead of pollarded firs; it possesses the necessary shape without lopping.

In describing the nesting-places provided for birds breeding in the open at Seebach, the shelter-wood for birds must first be considered, and then a number of similar plantations.

(A) *Shelter-woods for Birds.*

The idea of planting shelter-woods for birds is a very obvious one, and was carried out formerly, though in a very simple fashion, by planting all kinds of brushwood, more particularly shrubs like hazel, osier, and willow, which are of little use for protecting birds, and by letting them grow in a wild tangle.

True, these plantations are better than none, and they improve the beauty of the landscape, but they are of no use for encouraging birds to settle. It is the merest chance if a bird ever builds in such a plantation, which is wanting in every requirement for the building of nests. The bird shelter-woods at Seebach, on the other hand, provide the most favourable opportunities for nesting, because, like the nesting-boxes, they are closely copied from Nature.

They are based on close observation of primitive nature in the primæval forests of Africa and America, where the eternal growth and decay, as well as the luxurious growth of the creepers which penetrate everywhere, provide the birds with the best possible opportunities for building. The falling trees, the pieces of trees and large branches, which were held up by creepers, break up the branches of the underwood. The dormant eyes sprout beneath the fractures, and form whorl-shaped ramifications in which innumerable nests will be built.

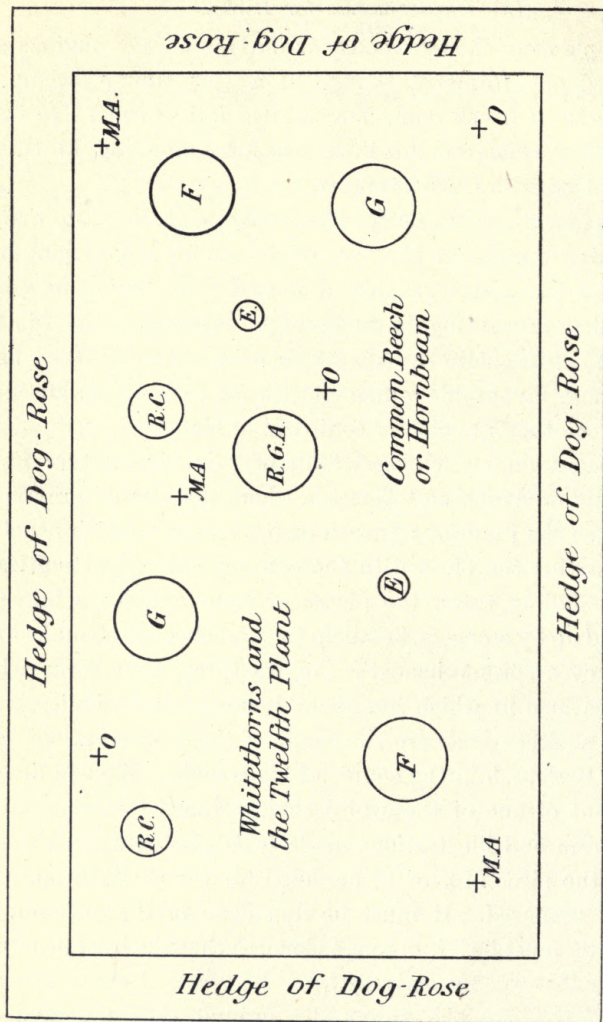
The present shelter-woods are the result of these observations made by Baron von Berlepsch in the course of his travels. We will describe the development of one of these bird shelter-woods by means of the following diagram and illustrations made from photographs.

First of all the piece of ground intended for the shelter-wood must be thoroughly prepared. It must be dug deep in the autumn, and during the winter must be left in rough clods, so that the frost penetrates deep, especially if it was formerly turf.

In the spring the ground thus prepared—the whole of the inside of the plan—must be planted with white-thorn; the twelfth plant must always be a beech or a hornbeam. The distance between the rows and the plants must be from 2 feet 6



PLAN OF SHELTER-
WOOD.



PLAN OF A SHELTER-WOOD FOR BIRDS.

O.—Oak. M.A.—Mountain Ash. G.—Wild Gooseberry. R.G.A.—*Ribes grossularia arborescens*.
R.C.—Red Cedar. F.—Fir. E.—Elder.

inches to 3 feet, according to the goodness of the soil. Here and there a few tall trees are planted that do not give too much shade, but which are to rise above the rest. Mountain ash (*m.a.*) and oak (*o.*) are best for this purpose. If there are other trees already growing on the spot they may be left if useful for the purpose, instead of others being planted.

This plantation is surrounded by a hedge of dog-roses (*see* plan, p. 56). Two, or better still, three rows of roses are planted about 2 feet apart, and with the same distance between each plant.



Fig. 1.—SHELTER-WOOD BEFORE CUTTING.

In the first year the copse therefore consists of the wild roses that surround it, the white-thorns and hornbeams in the interior, and the trees that stand here and there.

It is absolutely necessary that the plantation should be frequently watered, weeded, and hoed if it is to thrive. If there is much game in the neighbourhood the plantation must be fenced in with a wire fencing, at least a yard in height, during the first year, or, better still, until the second cutting.

In the second year groups of the bushes recommended on pp. 54 and 55

should be planted in the copse, as indicated by circles in the diagram, especially gooseberries, tall gooseberries, and the dwarf variety of the wild currant, privet, in certain circumstances both varieties of *Lonicera*,* single red cedars† and firs, especially Norway spruce, kept low by pollarding. If possible a space of 1 to 1½ yards should be kept clear round the firs to prevent them withering at the side.

The white-thorns must, of course, be removed from the places which these groups are to occupy. They can generally be made use of elsewhere.



Fig. 2.—SHELTER-WOOD AFTER THE FIRST CUTTING.

Of course the copse can be properly planted in the first year, *i.e.*, the groups mentioned can be put in. It is merely a matter of convenience if they are not put in till the second year, since very often when the plantation is begun the necessary plants are not all at hand.

* As the *Lonicera* spread very much, they can only be recommended for large estates. They had better be omitted in small woods.

† The common juniper was used till recently at Seebach. Most breeders in the open readily build in it; but it was found that it unfortunately dropped its dry sharp needles into the nests with eggs, which were then deserted by the birds.

The bird shelter-wood has now been planted. At first it must be left entirely to itself until in the third or fourth year, or, if the soil is very bad, in the fifth year, it somewhat resembles Fig. 1.

In the third, fourth, or fifth year, according to their growth, all the plants, except those joined in groups and the isolated tall trees and the rose hedges,* are cut down to the ground in order that they may grow up as spreading bushes instead of single stems. Nothing is left of the whole plantation therefore but the groups and tall trees marked by circles and crosses on the diagram and the rose hedges. The



Fig. 3.—SHELTER-WOOD AFTER THE SECOND CUTTING.

former only require simple pruning in order to produce a dense growth. The copse now resembles Fig. 2.

During the following years the copse develops by means of the new shoots to an impenetrable thicket, fenced in by a very thick hedge of wild roses. It, therefore, once more resembles Fig. 1.

Many people think enough has been done, and that the copse, in

* Recent experience has shown that the roses thrive better if they are not pruned. If the roses in the illustration seem to have been pruned, it is so that the interior of the wood may be seen more clearly. In reality the rose hedge remains standing.

which, perhaps, a few nests are already to be found, is finished. They think the plants may now grow in wild confusion. But the contrary is the case. The copse derives its full value from correct pruning.



Fig. 4.—FRESHLY PRUNED BUSHES.

In the sixth, seventh, or, if the soil is very poor, in the eighth or ninth year, the dense copse must again be cut down, but now isolated bushes, which may be called stock-bushes, are left at intervals of five

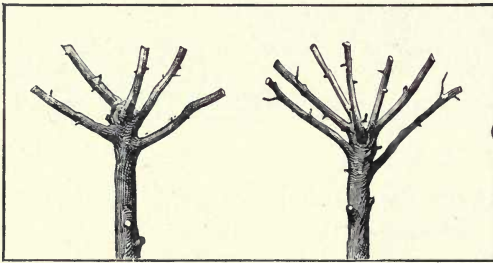


Fig. 5.—ONE-YEAR-OLD WHORLS RECENTLY PRUNED.

or six paces, and their numerous sprouts are lopped at varying heights— $\frac{1}{2}$, 1, $1\frac{1}{2}$, and 2 yards above the ground (see Figs. 3 and 4) They should be cut close above the dormant eyes, so that the new growth forms whorl-shaped ramifications, which serve the birds as a foundation for their nests.

These whorl-shaped sprouts must be cut back next year, as in Fig. 5, and this must be done annually as in Fig. 6, for this causes them to ramify, and the birds settle in them all the more readily. The earlier the pruning is done, the earlier the sprouting takes place. Autumn is better than spring, on account of the early broods.

Between the stock-bushes the hedge with the bushes which have again been cut to the ground, shoots up anew as a protection.



Fig. 6.—OLD WHORLS RECENTLY PRUNED.

These bushes are at first left untouched when the whorls are pruned, and they are only cut where they have become sufficiently long and thick to give too much shade to the whorls. Experience has taught that the whorls cannot stand this—either they do not develop or they die. In a few years the whole hedge will have developed to such an extent that the stock-bushes can scarcely be distinguished from it, and the whole resembles an impenetrable thicket.

The whole wood must, therefore, be cut to the ground every five or six years, with the exception of the stock-bushes, the tall trees, the rose hedge, and the plants forming the groups. In order not to interfere with the settling of the birds, the copse may be divided into several parts, which are alternately cut down in different years.

A bird shelter-wood of this kind thus requires seven to nine years before it is complete, as generally three-year-old plants are used. Our object may be attained quicker if we use older plants.

Abundant proof is found every year at Seebach of the remarkable fondness shown by birds for the whorl-shaped ramifications. According to the *Ornithological Journal*, 1904, p. 490, no fewer than 85 nests were found in the autumn of 1904 in the oldest shelter-wood, which is about 8 yards wide and about 230 yards long; that is to say, one nest for less than every three yards. In the autumn of 1906,

the forester Kullmann, who was sent by the Government of the Grand Duchy of Hesse, and the well-known ornithologist, Pastor Kleinschmidt, who was there at the time, were able to verify the fact that there were 73 nests in the same wood in a distance of 110 yards—one nest, that is to say, to about every one-and-a-half yards.* It is certainly worth noticing that, with two exceptions, these nests were built in the artificially-produced whorls.

Where no good land can be obtained for shelter-woods, ground that cannot be used for agricultural purposes, quarries, clay pits, and sand pits, steep slopes, dead angles in fields, in farmyards and gardens, ditches, sloping banks, outskirts of meadows, pastures and commons, etc., should be laid out on the same principle.

Every copse already in existence, every bush, park, even separate hedges and groups of trees, may be used more or less as shelter-places if the directions given above are carried out as far as possible. In parks and similar places lying on the high road the woods must be hidden by bushes, partly as a protection, partly to conceal from sensitive eyes, the mutilation necessary to fit them for their purpose. It is easy enough to combine beauty and usefulness.

This has been done in various places, as at Magdeburg, where in the town park at Herrenkrug, consisting of 1,500 acres, bird-protection was encouraged by planting regular bird shelter-woods, on the Berlepsch system, in the midst of covering bushes.

Experience has shown that excellent results can be obtained in districts poor in birds, if a bird shelter-wood is planted. We can be fairly sure that our best and favourite songsters, notably the nightingale, will then settle there in very surprising fashion.

For this reason the authorities encourage the planting of shelter-woods for birds in vine-growing districts as the best means of encouraging the settlement of birds which prove so useful a remedy against the *Eudemis botrana* and the *Tortrix pilleriana*, and as the best protection for the woods.†

* In the years immediately following there were fewer birds both at Seebach and elsewhere. The settlement reached the highest number observed in 1906.

† The largest of these plantations, laid out strictly in accordance with the preceding directions, is at present growing up between Eltville, Steinberg, and Kloster Eberbach. The bird shelter-woods lie between the valuable vineyards and comprise about five acres.

(B) *Plantations in general.*

Shelter-woods must serve more or less as a model wherever growing fences or hedges are planted, where roadsides, streets, railway embankments, banks of rivers and ponds are planted, and where undergrowth is planted in the woods, if they are to be useful for protecting birds.

In proof of this, we find at Seebach a number of devices which serve, first of all, to attract birds to settle, and also to connect the shelter-woods with one another and with the park.

A hedge of firs, growing for about 547 yards at the side of a ditch, deserves special mention. It is planted on one side with pollards, on the other with mountain ash (*see* illustration). This fir-hedge, now thirty years old, was planted in three rows with a space between the rows and also between the plants of one yard, and was kept low by lopping.



HEDGE OF FIRS.

The left-hand side represents the portion cut four years before the right-hand side, which has been recently cut.

When the branches spread too much the centre row was entirely removed, and in the remaining row every other fir was taken out. All the branches, even the lowest, have been well preserved by this method, and also for the reason that the hedge was never clipped at the sides; and this hedge now forms a thicket about seven yards in width, in which innumerable nests are found every year. The space which has been formed between the two rows of lopped trees, under the thick branches, serves in the winter as a shelter and feeding place for game.

The hedge is now cut only every four to six years, and for this purpose is divided into six parts.

An avenue of Canadian poplars, which stretches along the brook for some way, serves not only as a passage for the birds between the park and the field-copses, but is used by a colony of over a hundred fieldfares and many other birds, including a few kestrels. Poplars and white-thorns are considered as breeding places for grubs, but they are so only when birds are scarce, *i.e.*, where the plants, especially the white-thorns, are not correctly treated and the poplars are not hung with boxes. It is to be noted that those years when the leaves of the tree have not been eaten are comparatively poor in birds. This proves that our object is attained, just as the best physician renders himself unnecessary in course of time.

If this were not the case, the long avenues of poplars and thousands of white-thorns would supply the whole Seebach district with caterpillars. But the opposite is the case. In the summer of 1908, which was comparatively poor in birds, the station chief, Herr Schwabe, found only a nest of the tineæ on the white-thorn, and even this did not thrive. On the fruit trees, experts could find no trace of caterpillars, though no steps had been taken to exterminate them. So, too, in Seebach, willows, ashes, and the various *Ribes* were entirely free from insects though no artificial remedies were used and though the last species is very liable to attacks from the sawfly.

The poplar trees of this avenue are lopped every five years in the manner shown in the accompanying illustration. The birds build their nests on the knotty excrescences produced by the lopping, particularly when there are young branches. Other trees in the park and the avenues, such as limes, maples, etc., are prepared for the birds without their natural growth or their appearance being injured. The branches and twigs of many of the trees, are pruned so that the same whorl-shaped ramifications are formed as in the stock-bushes of the shelter-woods without injury to their appearance and growth.

The home park at Seebach deserves special attention. There, as we said before, all the trees of Central Europe are represented. The undergrowth, consisting chiefly of white-thorn, different varieties of gooseberry (latterly especially *Ribes grossularia arboreum*, and *Ribes pumilum*), yew, privet, etc., which grows under the dense foliage of

trees, has been treated like the shelter-wood without in any way producing a displeasing effect.*

A peculiar place for nests, which has proved very successful, was recently provided by tying several branches of a bush together, as may



With four-year-old shoots.



Freshly cut.

POPLARS.

* Special stress is to be laid on the importance of producing undergrowth, particularly on the outskirts of woods. All the plants recommended above for the shelter-woods may be used. The varieties of *Ribes*, *Lonicera*, and privet are the best able to bear shade.

be seen in the accompanying illustration, and in this simple fashion forming the whorl-shaped foundation for nests.

The success which has attended this mode of procedure is extraordinary. Out of fifty bushes thus tied together, forty-seven were occupied the first year. But, in spite of this, Baron von Berlepsch would only have this done as a makeshift; it serves merely as a temporary substitute for the whorls which are not yet ready.

Mention has yet to be made of stacks of brushwood. These arrangements for nests were made use of by birds elsewhere, but were less



BUSHES TIED UP TO PROVIDE NESTING-PLACES.

successful at Seebach, probably because there were sufficient and more desirable places for nests to be found there.

Excellent provision has also been made, by means of plantations in the pond of the home park and on its banks, for water-fowl, some species of which have lately decreased so noticeably that great stress should be laid on their preservation. Water-plants, such as reeds, flags, and sedges, and bushes hanging over the water, provide ample shelter and places for nesting.

Wild duck breed on the shore, the nest of the moor-hen is found under the branches of a bush of dogwood, on the surface of the water floats

the nest of the little grebe, and that of the kingfisher is on the bank. It is very interesting to see these birds diving and swimming in the water with their young.

Baron von Berlepsch intends to pay particular attention in future to experiments dealing with protection of water-fowl. The pond is a very suitable place, because it is directly connected, by means of a ditch, with the neighbouring brook, which serves as a good means of attracting the birds that pass that way.

Owners of parks and similar grounds, and especially those persons to whom the care of these places is entrusted, such as gardeners and others, should bear in mind the hints given above; or, better still, they should seek instruction by a visit to Seebach itself.

Who would not like to attract as many of our feathered favourites as possible to his own garden, park, etc., where they not only enliven Nature by their song and their bright ways, but act as watchful guardians, attacking all kinds of harmful insects?

(c) *Special Measures.*

A few measures taken at Seebach must be mentioned in order to complete the directions given above:—

1. The fallen leaves in the shrubberies, park and wood, must be left on the ground as far as this is compatible with other considerations. The birds find their food under the leaves, and are warned of the approach of their enemies by the rustling of the leaves. Experiments carried out in the shelter-woods have proved how important this is, for those parts of the wood where the ground had been cleared of dry leaves were avoided by birds in a striking manner.

2. The removal of stacks of faggots and wood, as well as grazing in the wood, must be avoided as far as possible in the nesting season.

3. Hedges must be cut, not in the breeding season, but early in spring and autumn, as has been ordered in Germany by various Government Departments. The custom of pruning at midsummer, which is unfortunately still practised in many districts, destroys many second broods, and this is prejudicial to the increase of birds, as second broods mostly consist of females.

4. If a plantation is to serve as a shelter-wood for birds, in addition to other purposes, the hints on the choice, the planting, and pruning of shrubs and trees must be attended to.

5. It should be remembered that a well-cared-for hedge is to be preferred to any wooden or iron fence round gardens and similar places for weighty reasons. A living hedge (*a*) serves as a nesting-place for birds; (*b*) is far more beautiful in the spring; (*c*) does not allow the carbon, which is so necessary for the growth of plants and which lies on the ground, to be wafted away with every breath of wind; and (*d*) is to be recommended on the score of cheapness.

(D) *Laying out of Reservations for Birds.*

By bird reservations we mean enclosed spaces specially devoted to birds and containing all the necessary conditions of life, and protection from injury by man and beast. They are looked on as the last refuge of birds, and are based on the measures given in the various chapters of this book. In fact, they combine all the measures serving for the protection and preservation of birds. Such reservations will probably, as a rule, be laid out by the state or community, or with their support, rarely by private people and societies. Land valueless for agricultural purposes and often lying waste can be utilized for this purpose.

It is essential that unselfish people be found in different places ready to conduct the laying out of the reservation. Probably officials and private individuals will be willing to render assistance.

The land in question must first be secured for the purpose. When the land is being cut up for small holdings and allotments, we must communicate with the special or general commissions who are ready to carry out our wishes and to make a grant of the land in question to the local boards or those interested in bird-protection. If the land is the property of the community a special order from the magistrates or some similar body is necessary. Generally a grant of money can be obtained from local funds at the same time. In many towns in Germany the governing bodies have themselves encouraged the formation of bird reservations and carried out the work as a matter of common interest. It is advisable to send some suitable person for instruction to Seebach first, so that the work may be efficiently carried out.

It will serve as a guide if the method in which a reservation was laid out at Heiligenstadt is described.

Although in accordance with the ministerial order of June 20th, 1908, hedges and other places suitable for nesting are to be preserved when land is divided for small holdings and allotments, yet a great deal is destroyed, as it has become a passion among people in Germany to exterminate bushes and trees. Therefore, I was anxious to prepare several good reservations in which birds could find refuge, as it is difficult to induce them to settle in a district from which they have once been driven.

In answer to my memorial, I was empowered by the Agricultural Board, at whose disposal I placed myself free of charge, to carry out the work, to superintend and direct the laying out of the bird shelter-woods in this district, and at the same time I was informed that the General Commission had received similar instructions. It was entirely owing to the kind support of the President of the Commission, Herr von Behr, that I was able to carry out this useful undertaking.

In answer to my request, which was based on the ministerial letter, I received two very favourable allotments. Each is about one acre in extent and forms a long peninsula between the juncture of a millpond and river-bed. Their proximity to the water, their secluded position, and the fact that they are of no other use, make these two plots of ground most suitable for the purpose.

I received £15 from the Royal General Commission, £5 from the Delegation, 30s. from the Society for Bird Protection, and 30s. from the Society for improving the beauty of the place. The town furnished labour free of charge.

I laid out one reservation in spring and one in autumn in 1908.

I will give a description of the first bird reservation to show that it is possible to avoid stereotyped and one-sided methods if we base them on von Berlepsch's measures.

The numerous pollards, natural nesting places for birds breeding in holes, were lopped so that the young plants to be planted beneath them should not be robbed of light. Then the whole area was planted according to the rules for shelter-woods (*see* pp. 55-62) with some 2,000 white-thorns, 200 to 300 copper beeches and hornbeams, seven groups, each containing about 50 *Lonicera* (*L. tatarica* and *L. xylosteum*), the dwarf Alpine red currant (*Ribes pumilum*), American gooseberry (*R. arboreum*), wild gooseberry (*R. grossularia*), privet (*Ligustrum*

vulgare), yew (*Taxus baccata*), Norway spruce (*Picea excelsa remonti*), and at suitable distances 12 oaks, a number of tall mountain ashes, and a few elders (*Sambucus niger*); in open spaces *Sambucus racemosa*, a few firs and red cedar.

On the banks of the millpond, which lies a little higher and which flows into the Leine, and along the other bank of which is a public walk, a row of privet was planted, interspersed with the plants of the groups named above, with the addition of silver firs and birches, in order to protect the wood and make it look pleasing from without. Towards the lower lying bank of the Leine the wood is enclosed by a hedge of two rows of wild roses. The bank itself is planted with various water-plants, pestilence weed (*Petasites*), flags (*Iris pseudacorus*), sweet-scented flags (*Acorus calamus*), alders (*Alnus glutinosa*) and osiers.

As the Leine is very shallow here in summer and autumn the opposite bank is to be fenced in with a wire fence at a width of 6 to 8 yards and suitably planted. The whole bed of the river therefore, for a distance of 280 to 300 yards, is to be added to the reservation, so that the birds can bathe and drink undisturbed in the shallow water.

A number of trees on the banks are hung with different kinds of Berlepsch boxes. Other arrangements for nesting are piles of turf with openings at the side for wagtails and hedge-sparrows, cavities built of stones for wheatears, etc.

In the midst of the plantation stands a Hessian food-house, for the construction of which the town supplied the wood free of charge. The wood is surrounded by water and the path leading to it, which is only 13 feet wide, is closed by an ivy-covered wooden fence with a door. A trap stands ready for vermin.

We hope that the bird reservation, which has only existed nine months, will prove very useful, and will cause the nightingale, which disappeared years ago, to settle here.

In addition to the two allotments a number of other fairly large plots were handed over for bird-protection when the land was cut up for small holdings. Among them is a very large ditch about $\frac{3}{4}$ of a mile in length, as deep as a house, and for the most part over 160 feet wide at the top. Along the bottom flows a brook. The high banks are to be planted like the shelter-woods; in specially dry barren parts

the speckled alder must first be used. I intend to construct a dam in this ditch in order to form one or more ponds, on the banks of which all sorts of water-plants will be grown, alders, willows, reeds, pestilential weed, calamus, flags, etc., so as to provide suitable shelter for water-birds, which are scarce owing to a lack of favourable conditions.

CHAPTER III.

FEEDING OF BIRDS IN WINTER.

SPACE will not permit us to discuss in detail the necessity for feeding birds in winter. It is sufficiently proved by the fact that in every severe winter a number of birds perish from want of food, and not from cold, as so many people believe.

If we are to carry out this winter feeding in a rational manner, our chief object must be to preserve the birds that remain with us during the winter and those that return from the south early in spring, accustoming them to certain districts.

Birds only require feeding during and after certain changes in the weather, especially during blizzards and intense frost. Careful observation shows that our smaller birds digest their food so quickly that a very few hours of want suffice to destroy great numbers of tits, tree-creepers, nuthatches, woodpeckers, golden-crested wrens, etc.

The best refutation of the argument that birds become spoiled by artificial feeding and no longer do their work in Nature's household is to be found in Dr. Liebe's words: "All food provided for insectivorous birds is merely a makeshift, as every bird protector can confirm. The birds find but a poor substitute, even in those arrangements which are fitted up with every luxury in the shape of mealworms and ants' eggs, for their natural food in woods and fields and gardens, which they always prefer. This fact explains what the astonished bird-lover often regards as black ingratitude, the sudden desertion, that is to say, of the feeding-places when the thaw sets in."

I would like to add that the swarms of tits, nuthatches, tree-creepers, woodpeckers, etc., only come at certain hours, generally twice a day, to the same feeding-place, when the weather is normal. The reason is that, as a rule, they visit a certain district by the same route and at fairly regular hours, and on their way visit the feeding-places just as they visit trees, as long as they can find their natural food there.

It is only when the weather prevents access to their natural storerooms that they stop all day near the feeding-places, and it is then that artificial feeding must come to their rescue.

It is a different matter in the case of those birds which inhabit a small area, such as a garden. They may be called tame to a certain extent, and have given up wandering over large districts, but it by no means follows that they eat nothing but artificial food, and have given up their work in Nature's household.

Kind-hearted people have always taken pity on our feathered winter guests. Feeding-places of the most varied description have been and still are arranged for birds, and all manner of feeding-appliances, often very cleverly contrived, were and are still used.

Drinking places for birds are being instituted, and are warmly recommended for summer and winter. They may, however, be looked on as unnecessary in winter. Experience shows that birds can quench their thirst with snow and pieces of ice, but well-arranged drinking places are most important in summer in districts with little water, where there is not much rain.

But often, when neither money nor trouble has been spared, the results have been out of proportion to the means employed. I know cases where food was used by the hundredweight, and was simply scattered in the street or on feeding-places in mud and snow, where, of course, the greater part was wasted, as far as its original purpose was concerned. But people feel satisfied and proudly conscious of having done a "good deed" simply because they have spent a considerable sum of money; they do not pay any attention to the fact that they have in no way relieved the birds.

Again it was Baron von Berlepsch who introduced a satisfactory solution of the difficult question of winter feeding. After experimenting for eleven years, he drew up three conditions necessary for the effective and sensible feeding of birds in winter, which, according to him, has for its main object their preservation. "The sensible and effective method of feeding birds must (1) be readily accepted by those for whom it is intended; (2) be carried out in all weathers—that is to say, the food must always be accessible to all birds, especially in sudden changes of weather, blizzards, wind, rain and frost, and must always be in the best condition; (3) it must be cheap—*i.e.*, the money spent on the food must really serve its purpose. The food must not be wasted or spoilt, but must be used by the birds to the last crumb."*

* "Ornithologische Monatsschrift," 1904, p. 374.

These three essential conditions cannot be carried out by any of the old methods of feeding, and the only modern ones which fulfil these conditions are those which make use of the appliances which Baron von Berlepsch has constructed—namely, the “Food-tree,” the “Food-house” (called the Hessian Food-house, because it was first used in Cassel), and the “Food-bell.” All who know anything about the matter must agree with this statement.

The new apparatus mentioned on pp. 85-89 are to a certain extent only variations of the old ones.

(A) *The “Food-tree.”*

This is the most natural of the appliances. I mention it first therefore in order to point out once more that all Berlepsch arrangements are based on careful observation of Nature.

The “food-tree” imitates a coniferous tree closely covered with insects’ eggs and *larvæ*, so that the hand of man has fashioned what Nature fortunately provides only in exceptional cases when there is a plague of insects.

All kinds of coniferous trees, especially firs, or else separate branches, can be used to form these “food-trees.” Attention must be drawn to the fact that living trees lose their leaves when hot fluids are poured on them, look ugly, and easily become diseased. They should therefore be chiefly used in woods, while in other places—in parks, plantations, farmyards, gardens, etc.—felled trees should be used, which can be purchased at a low price.

Trees that have been used as Christmas trees in hot rooms are not very suitable, as they soon lose their leaves.

On one of these trees a mixture of food is poured, which, as it is to serve for insectivorous as well as graminivorous birds, should be prepared from the following recipe :—

	oz.
White bread (dried and ground)	4½
Meat (dried and ground)	3
Hemp	6
Crushed hemp	3
Maw	3
Poppy flour	1½
Millet (white)	3

	oz.
Oats	1½
Dried elder-berries	1½
Sunflower seeds	1½
Ants' eggs	1½

To the total quantity of the dry food as above add about one-and-a-half times as much fat, beef or mutton suet. As the fat easily evaporates in a fluid condition, more suet must be added after the mixture has been warmed several times. Food made from this recipe is sold by the firm of Hermann Scheid, at Büren, in Westphalia, under the name of "Food-stones."

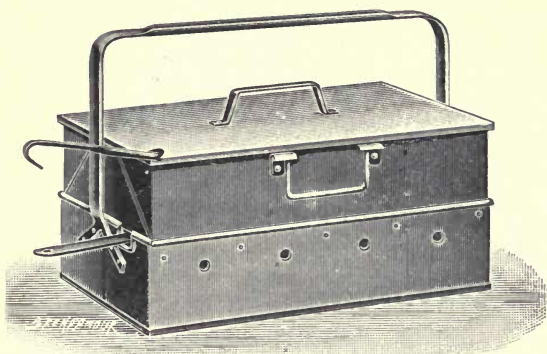


FIG. 1.—HEATING APPARATUS (CLOSED).

It is by no means necessary to keep closely to the recipe; it is only to serve as a guide, and can be altered. The chief part of the mixture must, however, always consist of hemp, whole or crushed.

This mixture is heated on the fire—if prepared at home the fat must be melted and then the dry foodstuff put in—well stirred, and, when boiling, poured on the branches of the tree. It is essential that the liquid mass should penetrate through the leaves to the branch itself, and this can only be done when it is very hot. It is a mistake to spread the mass on the branches when it is beginning to cool, for this brings about the very thing we want to avoid—a greater surface of food is exposed; it is covered by ice, hoar frost, and snow, and is rendered inaccessible to the birds.

At the Seebach experimental station, and in many other places, a special warming apparatus is used to prepare the "food-tree." Not

only are the separate parts very useful for pouring on the food, but it has this very great advantage, that the hot food can be kept warm for a long time.

Fig. 1 shows the apparatus closed, while Fig. 2 shows clearly its constituent parts—two receptacles, one on the top of the other, of the same shape, and made of galvanized iron. The upper division (18 inches long, 10 inches wide, and 4 inches deep) is used to melt the food, the lower is heated by fuel, and serves to keep the upper part warm; there is also a round pan with a long handle which is placed between the upper and lower receptacle over the fuel when the

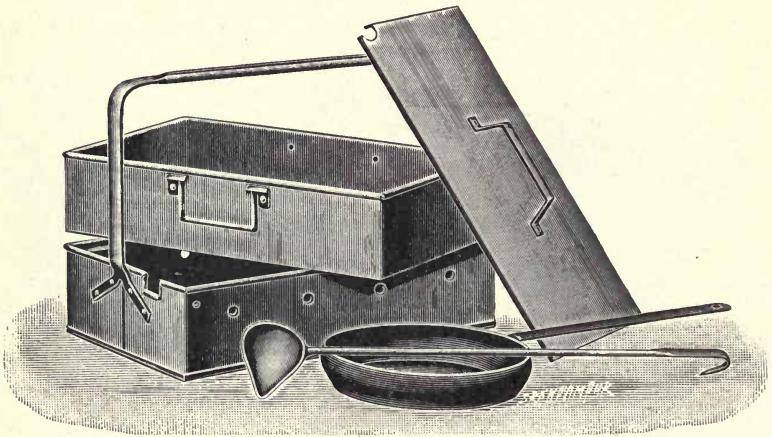


FIG. 2.—HEATING APPARATUS (OPEN).

apparatus is closed, and a tin ladle. Any ironmonger can easily make one of these apparatus from the illustrations.

Figure 3 shows clearly how the food is to be poured on when the warming apparatus is used. The pan, held in the left hand, contains the food taken from the upper iron receptacle, and serves at the same time to catch the fat that drips from the branches.

If the food is poured on by two people, the upper receptacle can be used instead of the pan. One person holds the receptacle with both hands, while the other ladles out the mixture with the spoon and pours it on. This method is by far the best.

As the solid substances sink to the bottom of the boiling fat, the mixture should be frequently stirred.

All species of birds visit the "food-tree"—even the long-tailed tit, which, as it dislikes coming down to the ground, rarely seeks any other kind of feeding-place.

For this reason, and because the birds are plainly visible, the "food-tree" affords a very interesting opportunity for observing them



FIG. 3.—POURING THE FOOD ON TO THE "FOOD-TREE."

in the neighbourhood of houses, near windows, in gardens, or in farmyards.

For this reason, also, this method of feeding is best for playgrounds and school gardens, and is preferred by many teachers. The children soon recognise how useful and true to Nature it is, and take a great delight in noticing the successful results achieved with the help of their teacher. They also become acquainted with many birds which they would not otherwise know.

(B) *The "Food-stick."*

The "food-stick" is similar in character to the "food-tree." It is a portion of a branch, 8 inches long by about 2 inches wide, provided on one side with six holes, $\frac{3}{4}$ inch in diameter and $\frac{3}{4}$ inch deep, while on the other side there is a French nail.

After the holes have been filled with the food-mixture described above, the piece of wood is fixed to a tree or post in a sheltered place by means of the nail. It is best to turn the holes half or entirely downwards, to protect them from frost.

These "food-sticks" are chiefly visited by tits, and serve not so much for feeding as for accustoming birds to come to a particular spot, so that they should be used near where there are nesting-boxes.

The "food-stick" can be obtained from Scheid by those who do not care for the slight trouble of making them.

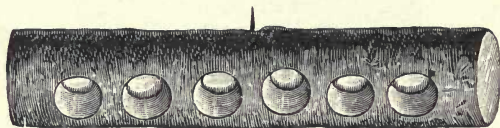


FIG. 4—THE "FOOD-STICK."

Experience, however, showed that, though the "food-tree" and "food-stick" fulfilled all conditions, they were not convenient enough for some people, so that the birds were not fed at all in winter as long as a simpler and equally useful way of feeding was not known.

This circumstance induced Baron von Berlepsch to invent a way of feeding which not only fulfilled the conditions already mentioned, but which could be easily carried out by a child or an unskilful workman.

The Hessian "food-house" and the "food-bell" were the result. Both are based on the same principle—the food-table in the one, and the self-filling food-dish of the other are protected from the weather, so that the food is always in good condition, and easily accessible for the birds.

(C) *The Hessian "Food-house."*

The arrangement of this can be plainly seen in Figs. 5, 6, and 7. It is to be preferred to all other ways of feeding. It consists mainly of a roof resting on four corner-posts, and a centre-post with the upper, actual food-table, and below it a smaller food-table. The food is placed

on the latter only until the birds have discovered the upper, proper table. Below the roof, right round the house, a strip of glass is fixed from post to post. It is of the greatest importance, and must not be omitted or replaced by a board, as has sometimes been done.

It not only protects the food from the weather, but also throws the necessary light on to the table.

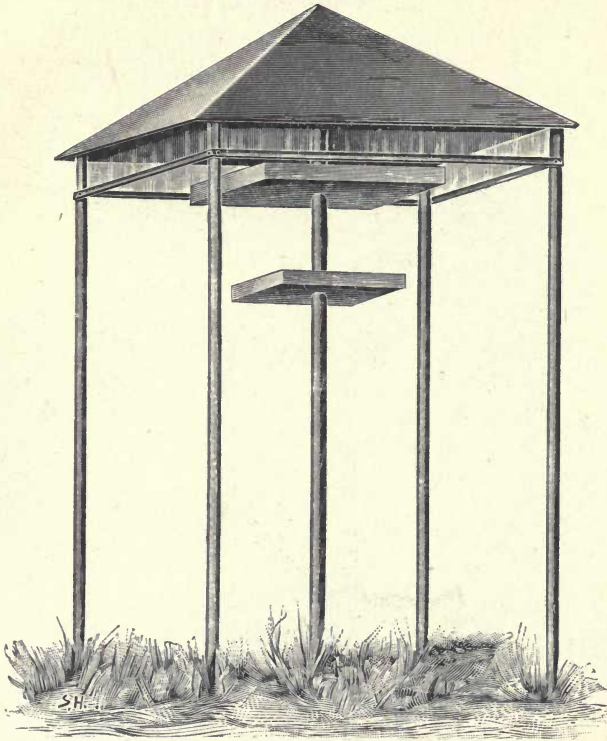


FIG. 5.—A "FOOD-HOUSE" WHICH CAN BE EASILY MADE.

The chief point in the "food-house," which makes it the best arrangement of the kind, is that the upper edge of the table is on a level with the ledge supporting the glass. The result is that the food is protected from every change of weather, is easily taken by the birds, and is accessible to them under all circumstances.

The measurements which are used in the factories, and which have been proved by experience to be the best for the "food-house," are :—Width from post to post, 4 feet 3 inches ; height from ground to glass

strip and upper edge of food-table, 4 feet 7 inches ; width of upper food-table, 2 feet ; the space between the food-table and the glass strip, 14 inches.

Anyone can easily make a similar "food-house" for himself, with the help of this description and Fig. 5.

Fig. 6 represents a complete house, which can be obtained from Scheid. The front glass has been omitted in the illustration, so that

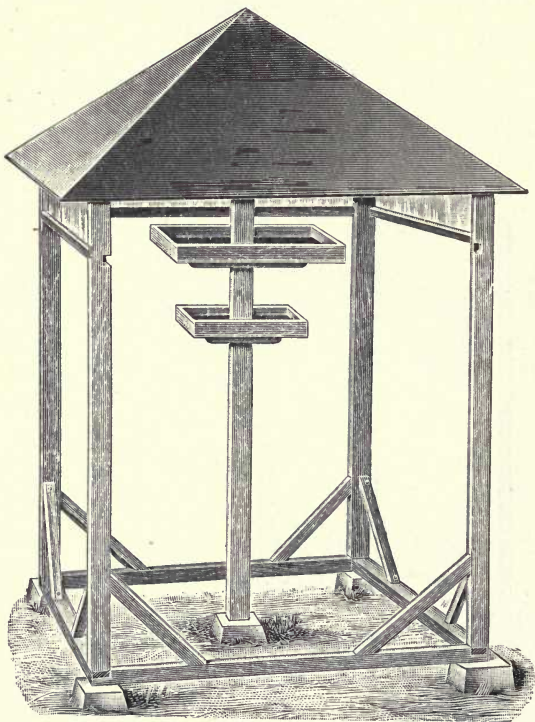


FIG. 6.—"FOOD-HOUSE" AS MADE BY H. SCHEID OF BÜREN

the interior may be more clearly seen. These houses are very durable ; they should stand on five slabs of concrete to protect them from decay, and can easily be erected according to the directions given with each house.

A fir tree is placed against three of the corner-posts, as is shown in Figure 7, in order to make the "food-house" look more natural, and thus prevent the birds from feeling afraid of it. A few branches

may also be placed under the roof: they are in great request as sleeping-places, and in the summer they are occasionally used by the wren as a nesting-place.



FIG. 7.—“FOOD-HOUSE” READY FOR USE.

Any kind of food can be put in the “food-houses” as well as seeds (hemp is best: never rape seed, which is scorned by all birds living

in the open), especially fat, suet and scraps of meat. The "food-stones" are also most suitable here: they are laid on the table whole or broken. In very cold weather they must be broken into very small pieces. Similar mixtures, which are not meant for pouring out, and are therefore made with less suet, are often called "food-cakes."

The "food-house" is soon visited by all species of birds: blackbirds, song-thrushes, finches, tits, wrens, and golden-crested wrens are its constant visitors.*

(D) *The "Food-bell."*

This is also covered in such a fashion that the hemp seed it contains—only hemp should be put in the "food-bell"—is protected from the weather, and yet is always within easy reach of the birds. The "food-bell" (see Fig. 8) consists of the food-dish A (diameter $2\frac{1}{4}$ inches, depth $\frac{1}{2}$ inch), the tube B (width $1\frac{1}{4}$ inch), the food receptacle C (contents $3\frac{1}{2}$ pints), and the metal bell D (diameter 1 foot). In constructing the apparatus the most important matter is that the lower edge of the tube is 1-16 inch below the upper edge of the "food-dish" A, and the upper edge of the dish 1-16 inch higher than the lower edge of the bell. The apparatus only works well if this condition is exactly observed, and only then is a wasting of the food prevented.

The "bell" works automatically, as soon as the receptacle—the lid of which can be unscrewed—is filled with hemp seed. In consequence of the peculiar, yet simple, construction of the apparatus, exactly the same number of seeds fall through the tube on to the dish as have been taken by the birds.

The "food-bell," like the "food-house," is a very economical apparatus, and as the receptacle is of glass, it is easy to see when it requires

* In Seebach the "food-house" is used to feed game as well as small birds. I think I cannot describe this arrangement better than in Baron von Berlepsch's own words:—"The 'food-house,' in addition to feeding our small birds, can be advantageously used as a feeding-place for partridges and pheasants. For this purpose I made the coverings of fir as dense as possible, leaving two entrance holes. I either had bushy firs put between the posts and pruned on the inner side, or I nailed a horizontal lath halfway between the ground and the strip of glass, and fastened fir branches to them, in addition to the firs at the corner-posts. In the space thus protected on all sides, another feeding-place is put under the food-table for the pheasants and partridges and, as a rule, it is promptly used by them."

refilling. It is very popular, because, as a rule, it is avoided by sparrows. The apparatus is to be had of Scheid, as well as "food-nets."*

The "food-bell" can be fixed on trees as well as on buildings, posts, windows, etc., in the way shown in Figure 9. The hooked rods sent with the bell are screwed in firmly at a suitable distance.

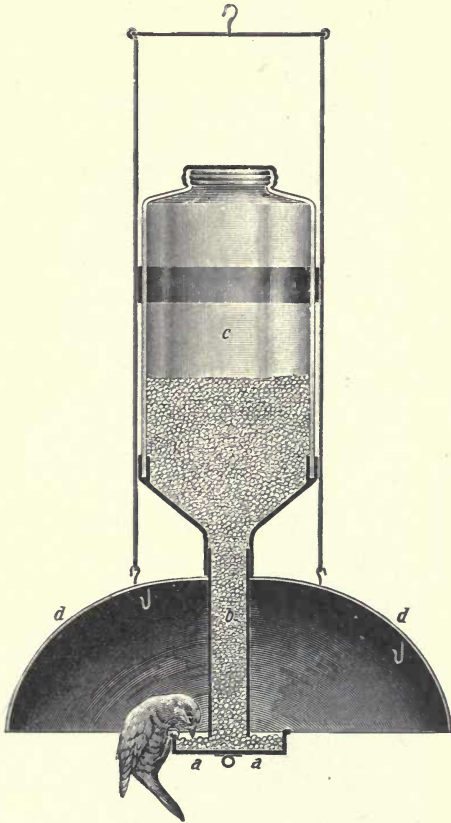


FIG. 8.—SECTION OF "FOOD-BELL."

a.—Food-dish.

c.—Food reservoir.

b.—Tube.

d.—Metal bell.

The apparatus is hooked on to the ring of the upper rod, while the ring under the dish is fastened with a wire to the lower rod, to prevent the bell from swaying too violently.

* Small fir twigs, covered with food, can be used instead of the "food-nets."

The wire must be at least 16 inches in length, so that squirrels, rats, etc., cannot jump on to the food-dish from the lower rod. There must be only one wire, not several twisted together, otherwise mice can climb up and get at the hemp. On the Seebach station a food-bell was repeatedly emptied by mice in this way.

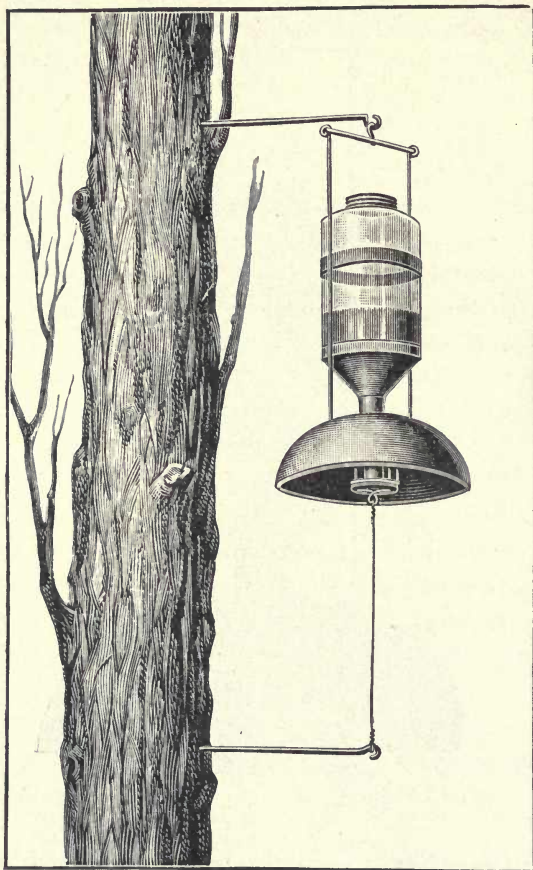


FIG. 9.—“FOOD-BELL” HUNG UP BY MEANS OF HOOKED RODS.

Instead of the upper rod, a sloping branch can also be used, and instead of the lower one, a post fixed vertically beneath it, to which the apparatus is fastened with wire. Two small nets filled with nut kernels, or two small fir twigs covered with food, are hung on the hooks inside the “food-bell” to tempt the tits at first; one

must be placed so that it projects well beyond the edge of the bell—the other is short, and is placed a little over and besides the food-dish. This bait need only be used once, while the apparatus is unknown in the neighbourhood; afterwards the “food-bell” is regularly visited by the birds.

In the district round Seebach and the wood at Kammerforst, there are seven “food-houses,” and twelve “food-bells,” which are distributed over the grounds, and feed hundreds of birds. The food used costs

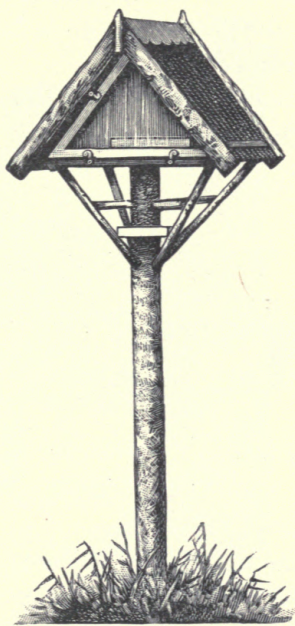


FIG. 10. — THE HILBERSDORFER FOOD-HOUSE.

on an average five pounds a year—a small expense when we consider the great extent of ground, and the successful result which is only possible because of these excellent and economical appliances. These facts should cause reflection, and put an end to the unmethodical and useless feeding which is still practised. Unfortunately, false economy leads people to avoid spending a considerable lump sum on the “food-house” and “food-bell,” although two or three times as much money will be spent on food given without method, and without serving much purpose.

The following new apparatus for winter feeding deserve mention :—

The Hilbersdorfer food-house (Fig. 10) is in reality only a small edition of the Hessian food-house and can be used everywhere where the former cannot be set up on account of its size and simple form. It is specially to be recommended for gardens, small parks, and grounds near villages.

The birds' food-manger invented by me consists as, Fig. 11 shows, to a certain extent of the upper part of the Hessian food-house, and can be used for feeding at the window, in the garden, or in grounds near the house. To enable anyone to make one for himself, the following directions are added :—

The food-manger consists of a simple sloping roof, under which on three sides are strips of glass to give light to the interior. On the

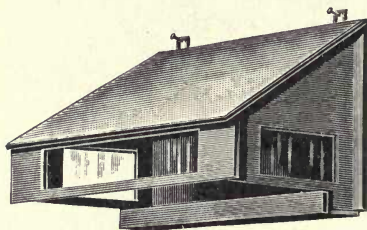


FIG. 11.—BIRDS' FOOD-MANGER.

lower edge of the back wall connecting the two side walls is a board some 4 to 5 inches wide with a ledge about $1\frac{1}{4}$ inches high, the food-manger. The upper edge of this ledge lies on a level with the lower edge of the front wall and both side walls. The space between the front wall and the food-manger must not be less than 8 to 12 inches, so as not to interfere with the approach of the birds. The back is provided with eyes for hanging up on suitable walls (houses, verandas, and summer houses).

To be obtained from Louis Kellner, Nachfolger, Heiligenstadt, Eechsfeld, Stubenstrasse.

Size I. Length, 50 cm. ; depth, 35 cm. 3.50 marks.

Size II. Length, 80 cm. ; depth, 40 cm. 5.00 marks.

The Brun Tit-box is made in two sizes and serves the same purpose as the food-bell, of which it is an enlarged form. It will not interfere

much with the use of the latter, which is far more ornamental, but size II., shown in Fig. 12, which hold 8 lbs. of hemp, may be emphatically recommended for large remote woods and similar places.

To be obtained : Verlag Parus, Hamburg 36.

Size I., complete, 2.80 marks. Size II., 5.25 marks.

The Westphalian food-house (Fig. 13), which revolves automatically in the wind, has recently been introduced by Scheid in addition to the Hessian food-house. Size of food-drum : Diameter and height,

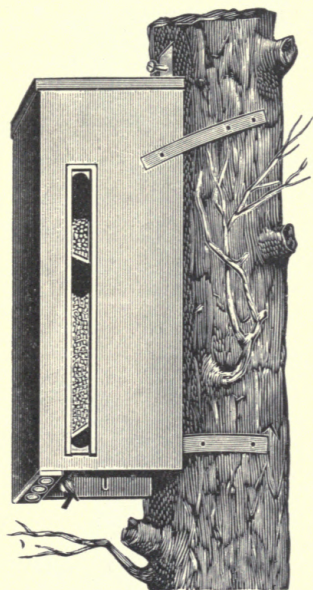


FIG. 12.—THE BRUN TIT-BOX.

27½ inches ; height of whole house, 6 feet 1¼ inches. It can also serve as a receptacle for a variety of foodstuffs and is specially suitable for plantations, parks, etc., on account of its appearance. It was tested by Scheid during several years and at Seebach last year, and stood the test well. The lower part consists of two concrete tubes standing one on the other and filled with cement. The upper part is made of strong metal. It must be set up with great care with the help of a level. Exact directions are sent with the apparatus. Price 30 marks.

There was no suitable and cheap arrangement for feeding birds at the window, but now this want has been supplied by the Schwarz feeding-box (Fig. 14), which revolves in the wind. It was tested at Seebach and found suitable for the purpose.

To be obtained from Gustav Ehrhardt, Schleusingen i. Th. Price, including packing, 2.25 marks.

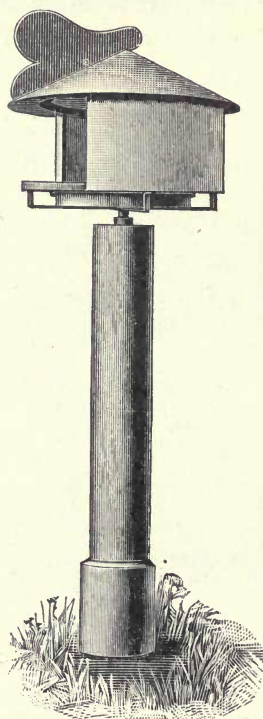


FIG. 13.—THE WESTPHALIAN FOOD-HOUSE.

A new invention, the Soltwedel food-ring, presents quite as attractive a picture as the food-tree. If it is provided with a protecting cover, it fulfils the conditions necessary for the correct feeding of birds, and we can recommend it. This food-ring, which is legally protected, and the cover, may be obtained direct from the manufacturer, G. Soltwedel, Deutsch-Evern.

In conclusion, we may say that, in addition to the feeding appliances described here, very useful feeding-places can be made on balconies

and verandas, in sheds, summer-houses, and refuge huts in woods, which fulfil the requirements mentioned on page 73. It is essential that, in accordance with condition 2, the food should in no way be affected by the weather. A feeding-place of this kind has been arranged in a stable in the wood near the ranger's hut at Seebach, where a long flat manger has been put under a projecting building like a veranda. The popular method of feeding birds at the window is also very useful, if the food is put out quite early before dawn in wet weather, and is frequently inspected during the day, so that the spoiled food can be replaced by a fresh supply. It is, however, advisable to set automatic traps for rats and mice, as otherwise they eat up the food during the night.

Appropriate food-stuffs for winter feeding have already been frequently mentioned. I will recapitulate the most important:—With the exception of rape seed, hated by all birds living in the open, all seeds can be used. The seeds that contain oil are most to be recommended, especially hemp, whole or broken; it should form at least half of all the foods.

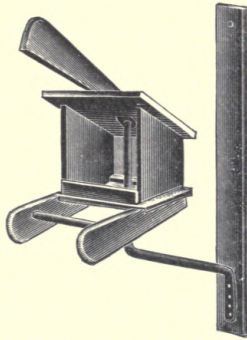


FIG. 14.—THE SCHWARZ FEEDING-BOX.

Great care must be taken with regard to the mixture sold in shops (a mixture of seeds of all sorts); at least half must consist of unbroken hemp seed, and there must be no rape seed.

The berries of mountain ash and elder make a very good food; if they are picked at the right time they will keep almost the whole winter. Of other foods, those containing fat should be used in the first place,

fat, suet, bacon, scraps of roast meat, etc. During cold weather fat is specially suitable for birds, as it produces warmth.

Great care must be exercised in the use of bread and similar foods, which easily decay, turn sour in damp places, and do harm to birds.

For all birds, insectivorous or graminivorous, "food-stones" or "food-cakes" (see pp. 74, 75, and 82) are the best. They can be given entire or broken up, and the colder the weather the smaller should be the pieces into which they are broken; they contain all the necessary material, and are very economical and lasting. The wisest plan is to give broken "food-stones," or "food-cakes" mixed with hemp seed.

In addition to these artificial foods, berry-bearing trees and shrubs should be planted; mountain ash, common and clustered elder, guelder roses (*Viburnum opulus*), and above all the common white-thorn. The first-mentioned retain their berries till Christmas only, the white-thorn through the whole winter, and is therefore invaluable in severe and prolonged winters.

CHAPTER IV.

SUPPRESSION OF THE ENEMIES OF BIRDS.

THERE is a danger that the success due to the provision of nesting-places and of food in winter may be seriously diminished, wherever the numerous enemies, to which birds are exposed, are not kept down. It is, therefore, not sufficient to create the necessary conditions of life for birds, their enemies must also be suppressed.

Unfortunately, man is still the worst enemy of birds. His love of destruction, selfishness, or unconscious indifference or ignorance, are in direct opposition to the aims of a rational protection of birds, hinder its progress, or do not assist it when the opportunity or the occasion arises.

The injurious effects caused by mankind will be dealt with in the following chapter. We will first discuss the suppression of harmful animals.

Only in very rare cases is it desirable entirely to exterminate an animal. On the other hand, the progress of civilization, which is the work of man, gives him the right, or rather obliges him, to use those means which are at his command to restore the balance of Nature, destroyed by him, and to interfere with the natural development of animal life.

Of course, we are taking for granted that moderation and reflection are his guides, and not the blind love of destruction. The birds of prey must not be treated alike. A few species are very useful to us ; others, again, have become so rare that we must cease destroying them to preserve them from extermination.

I consider Baron von Berlepsch's views on this matter of such importance that I will reproduce his actual words, as I heard them at a lecture :—" Therefore I should not wish a reward to be offered by the State for any animal which might possibly be exterminated by energetic persecution ; but I would always maintain the right of the

individual to self-help—*i.e.*, if an animal is troublesome to anyone, he must be able to obtain permission to get rid of it. In this way the lives of our birds, especially the rarer kinds, are respected, as well as the reasonable wishes of individuals.”

These words seem to show us a golden mean, and they give food for reflection both to those who love to destroy as well as to those who wish to restore Nature to its primitive condition by leaving animals and plants to thrive at will.

I will confine myself to the measures taken at Seebach in discussing this subject.

The following animals are considered at Seebach as thoroughly harmful, and they are treated as such, rewards being offered for their capture and death: cats, weasels, martens, polecats, house and tree sparrows, sparrow-hawks, goshawks, jays, and magpies. At certain times in certain places we must add squirrels, crows, and shrikes.

Certain birds, which are useful enough in themselves, may become harmful if they increase too rapidly—*e.g.*, blackbirds—and interfere with the settling of other birds: of the nightingale, for instance, according to what is reported from many districts.*

Sparrows, though they do not directly injure other birds, interfere very much with their settling. Their wild behaviour and continual noise make other birds take a dislike to a place, and drive them away from feeding and nesting-places. Where success with nesting-boxes is aimed at, the fight against sparrows must not be overlooked.

The war of extermination against sparrows has been waged for fifty years in Seebach with great energy, and they are now to be found there in small numbers only. The other species of birds, on the other hand, are represented all the more numerous, so that Baron von Berlepsch's assertion “that the increase of other birds is in inverse ratio to the decrease of the sparrows,” appears to be confirmed.

* The struggle for existence is to be found everywhere in Nature. If two creatures, such as the nightingale and the blackbird, enjoy the same conditions of existence, the weaker of the two must succumb if occasion for a struggle arises in consequence of insufficient food, scarcity of nesting-places, etc. This state of things has led to those observations which at first sound contradictory, on the relations between the blackbird and nightingale. In one place the former is said to drive away the latter, in another they live peacefully side by side. Both statements are correct. It all depends whether there is sufficient to satisfy the two species in a district, or whether anything occurs to cause a struggle for existence. In the latter case the weaker of the two—*i.e.*, the nightingale—must, of course, succumb.

Rats and mice are even more dangerous to birds than is generally supposed. The first especially not only destroy the nests of many birds that breed on the ground, especially water-birds, but they climb the highest trees to reach the nests and nest-boxes, and kill the birds and their broods. A whole family of five rats was found and killed by me in a box hanging thirteen feet high on a tree.

The usual poisons and traps are an unsatisfactory way of combating this evil. In ratin we have a remedy which offers a sure means of destruction for rats, and does not injure our domestic animals, while if we spread sufficient it will have a fatal effect on all the rats. Löffler's mouse typhus bacillus is to be specially recommended against mice.

The weasel is the most harmful of vermin, and the sparrow-hawk of the predatory birds, for he carries on his trade as robber with great boldness and skill.

The buzzard and the kestrel are quite harmless. The latter breeds in the midst of the shelter-woods at Seebach, the former in a wood which is full of nesting-boxes.

The jay is particularly harmful because it is thoroughly conscientious in searching every bush and tree for birds and their broods. Unfortunately, the amusing squirrel does the same, and unfortunately also, he likes to attack the larger nesting-boxes. In order to prevent mistaken ideas, I think it advisable to refer once more to what was said on pp. 91, 92. Neither Baron von Berlepsch nor I desire to exterminate any animal; but everybody must acknowledge that certain creatures, such as squirrels and jays, can increase to such an extent under favourable circumstances that they fully control a district, and scarcely any singing bird can escape them. Man must interfere and regulate matters. Unfortunately, the influence of civilization is so strong, that Nature is not always able to right matters everywhere. Therefore we must assert that, in order to restore the balance of Nature destroyed by man, we must to a certain extent interfere with the life of animals, always keeping within well-considered and moderate limits.

As the enemies of birds differ in various localities, in number and species, and hence in importance, the hints given here can merely serve as a guide, and everyone must be governed by the conditions existing in his particular neighbourhood.

SECTION III.

CO-OPERATION IS NECESSARY FOR A RATIONAL PROTECTION OF BIRDS.

To promote and spread the protection of birds, which is both necessary and important, requires the co-operation of the State, of local authorities, societies, individuals, and, especially, of the schools. The task of the authorities, especially of State officials, is not only to protect birds, but, above all, to interest the people in the subject, especially by influencing officials, general commissions, local boards, the administration of woods and forests, school committees, and others. As we have already mentioned, many States have energetically encouraged efforts to protect birds in an efficient fashion.*

We would impress on all who wish to be of practical use the necessity of carrying on their work in a thoroughly efficient manner. It is better to work slowly and well than to do much in a wrong way. Nothing is more discouraging than failure, but this can only result from carrying out the measures wrongly or from making use of wrong measures. By lectures, pamphlets, direct instruction, and information, intelligent people and societies can do much to further the cause.†

I wish specially to refer to the effective activity with regard to practical bird-protection of the "Königlichen General Kommissionen." Formerly they were our worst enemies on account of their inconsiderate behaviour when dealing with the small holdings and allotments, but now, thanks to the instructions of the Minister of Agriculture, they have become active promoters of bird-protection. Undoubtedly they can be as useful as formerly they were the contrary.

If the small holdings signify an attack on the right of individuals, they also exercise a powerful influence on the agricultural character of the land, often enough a bad one on nature as a whole and on the world of birds in particular. Not only the landowners, but also strangers who are not materially affected, feel this unpleasantly. It is therefore quite right that the Royal General Commissions now do

* It is much to be hoped that the catching of birds in snares, and the massacre of our singing birds in Italy, will soon be put an end to by the interference of the authorities.

† Instruction in bird-protection might easily be added to the annual courses for fruit culture which take place in many districts.

their best (a) to preserve as far as possible the existing breeding places; (b) to provide suitable breeding places.

The "Commission for Furthering the Protection of Birds," appointed by the Union of the German Societies for the protection of animals, will, in the future, play an important part in the history of the protection of birds in Germany. Its officers are: Professor Grosz, teacher of Forestry at the Forstakademie, Tharandt, Saxony (president); Max Rabe, Leipsic, Weststrasse 91 (secretary); Pfarrer Otto Kleinschmidt; and Major Henrici. This Commission keeps in touch with the Seebach experimental station and has set itself the task of examining everything new, whether practical or theoretical, that is suggested for the protection of birds, and giving an unbiased opinion purely from the expert's point of view. It is thus the enquiry office for the protection of birds, and all enquiries should be addressed to the secretary, Max Rabe, or to the experimental station at Seebach.

The names of the members are sufficient guarantee that their object will be attained. If a practical test requires a long time, it will be carried out at the Seebach experimental station, which Baron von Berlepsch has placed at the disposal of the Commission for this purpose.

It is therefore to the advantage of the cause, and also of the general public, if all doubtful cases are referred to the Commission.

Even if official bodies, societies, and individuals are active in the cause of bird-protection, the chief thing has still to be effected—the great masses of the people must be won.

Intelligent people who are seeking for an intermediary who shall introduce the established ideas on bird-protection to the masses, will naturally think of the schools. "Teachers and clergymen are the most competent people to act as ornithological pioneers," says Baron von Berlepsch, with a clear understanding of the matter; and teachers, as well as ornithologists, must acknowledge that not only the cause of the protection of birds, but the character and disposition of the children are greatly benefited by suitable instruction in this subject.

It is not a question of inflicting a new burden or a worthless theory on teacher and pupil. It is possible to combine the awakening of an understanding for a sound protection of birds with the usual school routine; and, besides, we are not dealing with experiments, but with established facts that have been well tested.

A teacher need not necessarily become a naturalist in order to further the cause of bird-protection. He must possess a love of the cause, be an attentive observer of Nature, and must conscientiously prepare for every lesson. It is by no means necessary to study learned works, as this book gives sufficient information. No addition need be made to the time-table. Undoubtedly, it would be a good thing if certain subjects dealing only remotely with natural history could be omitted, and others on the birds of the country could take their place in the curriculum.

The necessary instruction in the protection of birds can be given easily in connection with other subjects of the lesson. For instance, when the woodpecker is mentioned, natural and artificial nesting-holes can be explained; and the nightingale can be connected with breeders in the open and shelter-woods for birds; the birds in winter with winter feeding, and so on. But, above all things, if our aim is really to be attained, we must throw aside the pedantry which not only fails to arouse the child's understanding of the beauties of Nature, and the wonderful arrangements of Nature, but even kills the existing interest. Only biological instruction can arouse enthusiasm, and only by its means can we attain what the "General Instructions" require of natural history lessons:—"The children should be accustomed to close observation, and trained to contemplate Nature thoughtfully." During walks taken together, in the playground and school garden, the children should be led to observe Nature carefully.

It is essential that they have an opportunity of doing actual work for the protection of birds, such as hanging up nesting-boxes, laying out and caring for shelter-woods for birds, winter-feeding, etc.

Here we see once more the importance of the school gardens which are being introduced more generally. We must not forget that besides tending and protecting plants, room must also be made for the protection of birds.

It is therefore the business of the school not only to train the pupils to take an interest in the cause, but it must also exercise a good influence on the home, through them and through its good example. It is only thus that we can succeed in winning people to a rational protection of birds, and only thus have we any guarantee that the measures will be correctly carried out.

CONCLUSION.

ALTHOUGH the increasing interest shown in the protection of birds is very welcome, and though we can safely reckon on an increase in the efforts in this direction, yet the most important thing is the way in which this protection of birds is carried out. We must keep to the principle that only that bird-protection can be of use which is the result of a careful study of our birds, of an exact knowledge of their habits and wants—in short, the scientific protection of birds.

The protection of birds as described in this book is the only method that complies in all respects with these conditions. I can assert that wherever, until now, a reasonable protection of birds promising success is observed, it can only be because the measures of Baron von Berlepsch have been used.

This should cause no surprise. Whoever has a close acquaintance with them—whoever has seen in the Seebach collection of natural and artificial woodpecker holes, the experiments that have been carried on for over thirty years, will be convinced that here is the laborious, incessant work of a lifetime.

I hope I have succeeded in explaining the measures so clearly and comprehensively that all may find this book a safe guide, and that the protection of birds, according to the ideas of Baron von Berlepsch, may become general.

This solution of the question possesses the inestimable advantage that every child can help to protect birds successfully. The rules are given here clearly and distinctly ; people need only follow them out carefully.

Description, explanation, and persuasion are all less effective than studying the subject on the spot, where not only the arrangements described in the preceding pages may be seen, but the extraordinary and astonishing success that has attended them is made apparent in the most convincing fashion.

Whoever wishes to devote himself to the protection of birds, who after reading the books on the subject is in any doubt, let him, this book in hand, inspect the experimental station at Seebach, which is open for this purpose—for words may instruct, it is true, but we can only be convinced by actual facts.

APPENDIX.

CALENDAR FOR ATTRACTING AND PROTECTING BIRDS.

OCTOBER is the month for reflection in matters appertaining to the protection of birds. We must now make up our minds what to do. The most important thing is the creation of opportunities for nesting, namely, the hanging up of nesting-boxes, and the planting of shelter-woods.

We can treat these matters briefly here, as we need only refer to the corresponding chapters in this book: nesting-boxes, pp. 30-53; shelter-woods, pp. 54-71.

It will be sufficient to draw attention to the fact that the ground that is destined for a shelter-wood must be deeply dug in autumn and left in great clods, so that the frost penetrates well. The planting is done in the following spring. The requisite plants can be ordered now and kept well wrapped up till the time of planting.

It is advisable to order nesting-boxes now, as the following month is the best time for hanging them up. Berlepsch's nesting-boxes are the only ones that can be recommended, and these should bear the registered trade-mark. (For prices see advertisement pages.)

These are the only boxes that possess the important improvement described on p. 38. The "Kommission zur Foerderung des Vogel schutzes" therefore begs that all interested in the matter will only use those nesting-boxes that bear this trade-mark. This is the only way of repairing to a certain extent the error which Baron von Berlepsch committed when he did not legally protect his boxes, and of protecting the public from failures due to worthless imitations. (See pp. 40-43.)

Provision should now be made for winter feeding by collecting elder berries, mountain-ash berries, sunflower seeds, and other seeds. Feeding apparatus should be inspected, "food-bells," "food-houses," "food-stones" should be ordered, so that everything is ready and in order at the right time. The "food-house" and "food-stones" and cakes can be made at home by the help of the instructions on pp. 74 and 78.

NOVEMBER is the most suitable time for hanging up the nesting-boxes. As all birds which nest in holes spend the night in holes, not only during their breeding time but during the whole year, the boxes hung up now are of use in winter. The birds which winter here become accustomed to the place they are to occupy in spring. (See p. 44 for further details.)

Winter feeding should now be begun, gradually, so that if the cold comes suddenly the birds will find food ready for them. The birds are not to have enough to satisfy them; they are only to get accustomed to the feeding-places, so that in case of sudden need they know where to find them.

The best way is to give them the economical "food-stones" or cakes at first. During normal weather these should be given alone, and other food, especially hemp-seed (pp. 81, 89), should not be given till it turns cold.

DECEMBER.—Nesting-boxes may be hung up in December, in fact, during the whole winter. The directions for October and November hold good for this month.

JANUARY AND FEBRUARY.—See October and November for hanging up nesting-boxes, and for winter feeding.

MARCH.—The planting of shelter-woods can be begun in March. When the land intended for this purpose has been properly prepared it is levelled and planted in accordance with Chapter II. Nesting-boxes may still be hung up in March and April. Winter feeding must not be given up yet. It may be particularly needed if there is a sudden return of winter, after the birds of passage have begun to come back. Almost every year chiff-chaffs and willow-wrens get into difficulties on this account, but only the "food-tree" is of use in this case. They have not been noticed at any other feeding-place. (See October and November.)

APRIL.—The directions given for March hold good for this month.

MAY.—The chief breeding time of our birds is in May and June. All preparations for nesting arrangements must be completed by now. Now, all that can be done for the protection of birds is to keep these places where birds can and may breed free from disturbance.

JUNE.—What was said of May holds good for June. Young shelter-woods for birds should be frequently hoed. (*See p. 57.*)

JULY AND AUGUST.—The rules given for June must also be attended to in these months. Hedges should not be cut till the end of August because of the broods.

SEPTEMBER.—At the end of the month begin collecting elder and mountain-ash berries. When dried they form very good winter food for birds living in the open as well as for cage birds. The end of August and beginning of September is a very favourable time for catching vermin.

Whoever intends to hang up nesting-boxes should seek suitable places while the trees are in leaf. This will prevent the occurrence of a common mistake by which the boxes hang too much in the dark when the tree is in full leaf, especially in chestnut trees. Most birds like a certain amount of covering, it is true, but they all avoid deep shade where no sun can penetrate.



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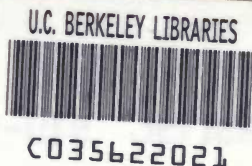
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